(33,854)

SUPREME COURT OF THE UNITED STATES

OCTOBER TERM, 1928

No. 545

STANDARD OIL COMPANY AND SINCLAIR REFINING COMPANY, PETITIONERS,

vs.

CITY OF MARYSVILLE, L. N. COLE, AS MAYOR; R. E. LONG, ET AL., ETC.

ON WRIT OF CERTIORARI TO THE UNITED STATES CIRCUIT COURT OF APPEALS FOR THE EIGHTH CIRCUIT

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[Caption omitted]

[fol. 1] Citation, in usual form, showing service on Earle W. Thomas and Thomas F. Doran, filed June 5, 1926, omitted in printing.

[fol. 2]

IN UNITED STATES DISTRICT COURT, DISTRICT OF KANSAS, FIRST DIVISION

No. 652-N. In Equity

STANDARD OIL COMPANY, a Corporation, Plaintiff,

vs.

THE CITY OF MARYSVILLE, KANSAS; CHARLES F. TRAVELUTE, Mayor; Leonard Cole, E. G. Filbert, Ed Hall, Paul Kirkpatrick, Oscar Terry, T. J. Austin, and Harry Thompson, Councilmen; Edgar C. Bennett, City Attorney; and P. Hayes, Marshal, of said City of Marysville, Marshall County, Kansas, Defendants

AMENDED BILL OF COMPLAINT—Filed Oct. 11, 1924

This cause being called for hearing at Kansas City, Kansas, on October 6th, 1924, and it having been made to appear from statements of counsel that the following changes should be made and errors corrected in the personnel and names of the parties named as defendants in the original Bill of Complaint herein, to-wit:

P. T. Burk, Sr., has been replaced as councilman of the City of Marysville, Kansas, and the name of Oscar Terry should be and is hereby substituted therefor.

The name of T. J. Austin should be and the same is added as a defendant councilman.

[fol. 3] Leave of Court having been first obtained to make the above substitutions and corrections, plaintiff files this its Amended Bill of Complaint herein, and alleges:

I

That the matter in controversy herein exceeds the sum or value of Three Thousand Dollars, exclusive of interest and costs.

II

That the cause of action herein set out arises under the constitution and laws of the United States.

III

That there is a diversity of citizenship between plaintiff and each of the defendants as hereinafter specifically shown.

IV

That this action is brought

A. For the purpose of procuring an order and decree of this court declaring void Ordinance Number Three Hundred fifty of the Ordinances of the City of Marysville, Kansas, for the reasons and upon the grounds that

(1) It is in contravention of the rights of this plaintiff under the provisions of Section One of the Fourteenth Amendment to the Constitution of the United States which provides that

"No state shall make or enforce any law which shall abridge the privileges or immunities of Citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law; nor deny to any person within its jurisdiction the equal protection of the laws."

(2) It is repugnant to the rights of this plaintiff under the common law and under the constitution and laws of the State of Kansas;

(3) The action of the defendant city in passing, or attempting to pass same, was and is ultra vires and said ordinance therefore invalid, because of lack of antecedent legislative authority conferring upon it power to pass same;

(4) Same is so arbitrary, capricious, discriminatory, unreasonable and subversive of private rights as to be a clear [fol. 4] abuse, instead of a bona fide exercise of power and as to deny plaintiff the equal protection of the laws and due process of law secured to it by the provisions of Sec-

tion One of the Fourteenth Amendment to the Constitution of the United States above quoted and to be void under the Constitution and laws of the State of Kansas;

B. For the purpose of procuring an order and decree of this court restraining and perpetually enjoining the defendants and each of them, from enforcing said void ordinance.

V

That the plaintiff is a corporation duly chartered, organized and existing under and by virtue of the laws of the state of Indiana, and at all of the times hereinafter mentioned was duly licensed and authorized to engage in business in Kansas as a foreign corporation, and was and is a citizen and resident of the State of Indiana and no other state.

VI

That the defendant, the City of Marysville, Kansas, is a city of the second class, duly organized and existing under and by virtue of and subject to the constitution and laws of the state of Kansas, and is now, and at all of the times hereinafter set forth, was a resident and citizen of the state of Kansas and of the First Division of the District of Kansas, and was not and is not a resident or citizen of any other state.

VII

That the individual defendants herein are the duly elected, qualified and acting officials of the City of Marysville, Kansas, respectively, as set out and shown in the title of this cause, and that each one of them is a citizen and resident of the state of Kansas, and of the First Division of the District of Kansas, and is not a resident or citizen of any other state.

VIII

That plaintiff is now and for more than ten years last past has been continuously engaged in the business of selling and storing for sale and distribution various products of petroleum, and in the usual course thereof has stored and kept and is now storing and keeping in tanks con-

structed above ground in various towns and cities of the state of Kansas, including the city of Marysville, Kansas, large quantities of gasoline and kerosene, to-wit: More than five hundred gallons in each of such tanks.

[fol. 5]

IX

That said tanks so used by plaintiff as aforesaid, and each and all of them, are equipped and at all times have been constructed, maintained and operated with the most modern, efficient and best safety appliances and devices known and in a prudent, skillful and safe manner.

X

That the storage and keeping of said products in such tanks so equipped and maintained and operated, adjacent to railroads and railroad switches within cities and towns, including the city of Marysville, Kansas, is now and for more than ten years last past has been a safe, useful convenient and necessary incident and practice of plaintiff's said business, and has been during said period and now is required by modern methods of commerce, transportation and habits of life and has been established, maintained and universally recognized throughout the state of Kansas and the United States as a necessary and legitimate means of conducting said business and same in no way infringes upon, injures or adversely affects the health, morals, safety or welfare of individuals or the public.

XI

That the plaintiff is now and for more than ten years last past has been transacting its said business and in the regular course thereof has maintained and operated as aforesaid tanks of the kind and character aforesaid in the said city of Marysville, upon the following described real estate occupied by plaintiff under a written lease from the Union Pacific Railroad Company, the owner thereof, to-wit:

Beginning at a point that is in the southeast corner of Lot Twelve, Block Forty, Original Town of Marysville, Kansas; thence north along east line of said Lot Twelve Seventy-one feet to a point; thence west at right angles to

initial course forty-four and three-tenths feet to a point distant eight and five-tenths feet easterly from center line of west leg of Old Wye Track of Manhattan Branch, at right angles thereto thence southwesterely parallel to and distant eight and five-tenths feet from center line of said Wye Track, seventy-four and five-tenths feet to the south line of said Block Forty; thence east along said south line of said Block Forty, seventy-two and two-tenths feet to a point of beginning.

[fol. 6]

XII

That the storage tanks now upon said above described real estate, or others of somewhat similar character and construction have been maintained and operated as aforesaid upon said premises continuously for more than ten years prior to the passage of said Ordinance number Three hundred fifty with the knowledge, approval and consent of the defendant city and without accident, or injury to persons or property, and that said business and the said use and maintenance of such tanks during all of said time has been and is now being carried on in a safe, sanitary and legitimate way.

XIII

That the said tanks and places of business of the plaintiff aforesaid are located upon a spur or side track of the Union Pacific Railroad Company outside of the fire limits established by the mayor and council of the city of Marysville, and in a sparsely occupied section of said city and not in close proximity to buildings of other persons, firms or corporations.

XIV

That in July, 1914, the Mayor and council of the city of Marysville, regularly passed and published Ordinance Two hundred thirty-seven of the Ordinances of the City of Marysville, Kansas, and that Section four thereof reads as follows:

"Section 4. Tanks may be constructed in the building if buried at least three feet below the lowest floor thereof, and isolated tanks constructed for the storage of gasoline, fuel oil and motor spirits in quantities of 5000 gallons or more,

may be constructed above ground at such locations as the Mayor and City Council may determine. Provided a permit designating the location and manner of construction must be procured from the Mayor and City Council therefor, before the construction of such tanks. Provided further, a permit for the maintenance of isolated tanks built upon the surface and now located within said city, if properly safe-guarded, will be issued."

A true and correct copy of said ordinance marked Exhibit "A", is attached to the original Bill of Complaint herein, and asked to be read as a part hereof.

XV

That permits were duly and regularly issued to plaintiff under and as provided for in said Ordinance number Two [fol. 7] hundred thirty-seven, and that same remained in force and effect until the passage of Ordinance Number Three hundred fifty hereinafter referred to.

XVI

That on to-wit, the eighth day of October, 1923, the mayor and council of the defendant city passed and published insofar as they could legally do so Ordinance number Three hundred fifty of the Ordinances of the City of Marysville, Kansas, being the ordinance complained of herein. A true and correct copy of said ordinance, marked Exhibit "B", is attached to the original Bill of Complaint, herein and asked to be read as a part hereof.

XVII

That the provisions of said Ordinance number Three hundred fifty are discriminatory and deny to this plaintiff the equal protection of the laws under said Section One of the Fourteenth Amendment to the Constitution of the United States in that Section One of said Ordinance required this plaintiff to bury its said oil tanks three feet under ground while Section three of said ordinance provides:

"Section 3. This ordinance shall in no case apply to the storage of any crude oil, distillate or fuel oil in containers of

a capacity of 500 gallons or less, but only one such 500 gallon container shall be permitted on each premises, nor, shall it apply to the storage of gasoline, kerosene or naphtha in quantities of less than ten gallons, all of which commodities in the quantities mentioned and permitted by this section shall be kept and stored in the manner provided by existing ordinance."

XVIII

That the provisions of said Ordinance number Three hundred fifty requiring tanks of the kind and character used by the plaintiff in the City of Marysville aforesaid to be buried underneath the ground are arbitrary, unreasonable and impossible of performance in that plaintiff's said tanks cannot be operated and maintained when so buried, and that the enforcement thereof therefore will result in the absolute confiscation of plaintiff's said property.

XIX

That it is more dangerous from the standpoint of the health and safety of the public to establish, maintain and operate oil tanks of the kind and for the purposes aforesaid [fol. 8] under the ground than above ground in the manner that plaintiff is now maintaining and operating same as aforesaid in the said city of Marysville and elsewhere.

XX

That said Ordinance number Three hundred fifty herein complained of and the enforcement of which is herein sought to be enjoined, prohibits plaintiff from maintaining and operating oil storage tanks of the kind and character aforesaid at any point within the corporate limits of the City of Marysville, Kansas, unless same shall be buried under the ground as aforesaid. That the said City of Marysville contains within its corporate limits numerous tracts of ground that are wholly vacant and used exclusively for agricultural purposes and each of which is of from one to ten acres in area. That said ordinance is so arbitrary and unreasonable in its provisions as to prohibit plaintiff from using any one of same to establish, maintain and operate its said business and with said tanks thereon above

ground, although that could be done without any possible injury or damage to either persons or property.

XXI

Plaintiff respectfully shows that said Ordinance number Three hundred fifty is so arbitrary and unreasonable, that it will drive this plaintiff's said business and that of others engaged in the same business aforesaid, from the city limits of the City of Marysville, or cause it and them to establish, maintain and operate oil tanks under the ground in a manner less safe than the one now employed by plaintiff as aforesaid, and if same is enforced it will result in the confiscation of plaintiff's property in violation of the provisions of the Federal Constitution hereinbefore set out and quoted.

XXII

That the penalties fixed by Section Five of said Ordinance number Three hundred fifty are unreasonable and arbitrary in that

"Any person, firm or corporation violating any of the provisions of this oridinance shall upon conviction be adjudged to pay a fine of $25.00 for each violation, and each day that any of the commodities herein referred to are stored in violation of the terms hereof shall constitute a separate and distinct offense hereunder."

[fol. 9]

XXIII

That the officers of the City of Marysville, herein named are threatening and attempting to enforce said ordinance. That they have caused the arrest of an employee of the plaintiff on a warrant charging him with the violation thereof. That he and other employees and agents of plaintiff are threatened with repeated arrests and fines under the provisions of said ordinance and the plaintiff has no adequate remedy at law. That said void ordinance will be enforced against plaintiff and its officers, agents and employees unless prevented by the equitable order of this court restraining and enjoining said city and each and all of its officers and agents from enforcing, or attempting to enforce, same.

Wherefore, plaintiff prays (a) that said ordinance number Three hundred fifty of the City of Marysville, Kansas, be declared and decreed by this court to be arbitrary, unreasonable, discriminatory, confiscatory of plaintiff's property in violation of plaintiff's rights under the constitution and laws of the United States and the common law, constitution and laws of the state of Kansas, and void; (b) that the defendants, and each of them, on presentation of this duly verified bill be restrained from enforcing or attempting to enforce said ordinance and that this cause be set down for hearing on the application for temporary injunction at an early date, and that on said hearing, a temporary injunction be granted, and that on the final hearing herein, said temporary injunction be made perpetual; (c) that subpoena issue out of this Honorable Court directed to each and all of the defendants, not heretofore served herein, to-wit: Oskar Terry and T. J. Austin, requiring and commanding them, and each of them, to appear in this case on a day certain and answer the several allegations of this Amended Bill of Complaint, (unless they shall forthwith enter their appearance herein), answer under oath being hereby expressly waived; (d) Plaintiff further prays for such other and further relief in the premises as to this Honorable Court may seem equitable and just in the premises.

Vermillion, Evans, Carey & Lilliston, Attorneys for Plaintiff, Wichita, Kansas.

Duly sworn to by Earle W. Evans. Jurat omitted in printing.

[fol. 10] In United States District Court

No. 653-X. In Equity

Sinclair Refining Company, a Corporation, Plaintiff,

vs.

The City of Marysville, Kansas; Charles F. Travelute, Mayor; Leonard Cole, E. G. Filbert, Ed Hall, Paul Kirkpatrick, Oscar Terry, T. J. Austin, and Harry Thompson, Councilmen; Edgar C. Bennett, City Attorney; and P. Hayes, Marshal of said City, Defendants

AMENDED BILL OF COMPLAINT—Filed Oct. 11, 1924

This cause being called for hearing at Kansas City, Kansas, on October 6th, 1924, and it having been made to appear from statements of counsel that the following changes should be made and errors corrected in the personnel and names of the parties named as defendants in the original Bill of Complaint herein, to-wit:

P. T. Burk, Sr., has been replaced as councilman of the city of Marysville, Kansas, and the name of Oscar Terry should be and is hereby substituted therefor.

The name of Harry Thompson is erroneously stated in the original bill of complaint as Henry Thompson, and the [fol. 11] name of Henry Thompson should be and is corrected to read Harry Thompson.

The name of T. J. Austin should be and the same is added as a defendant councilman.

The name of P. Haines, erroneously appears in the original bill of complaint as Marshal of the City of Marysville, Kansas. Said name should be and is corrected to read P. Hayes.

Leave of the Court having been first obtained to make the above substitutions and corrections, plaintiff files this its amended bill of complaint herein, and alleges:

I

That the matter in controversy in this cause exceeds the sum of Three Thousand ($3,000.00) Dollars exclusive of interest and costs.

II

That the cause of action herein set out arises under the Constitution and laws of the United States.

III

That there is diversity of citizenship between plaintiff and each of the defendants as hereinafter specifically shown.

IV

That this action is brought,

A. For the purpose of procuring an order and decree of this court declaring void Ordinance No. 350 of the Ordinances of the City of Marysville, Kansas;

(1) As in contravention of the rights of this plaintiff under the provisions of Section one of the Fourteenth Amendment to the Constitution of the United States, which provides that:

"No State shall make or enforce any law which shall abridge the privileges or immunities of citizens of the United States; nor shall any State deprive any person of life, liberty, or property, without due process of law, nor deny to any person within its jurisdiction the equal protection of the laws."

[fol. 12] (2) As repugnant to the rights of this plaintiff under the common law and under the Constitution and Laws of the State of Kansas.

(3) As ultra vires the powers of the Mayor and councilmen of the City of Marysville, Kansas, to pass such ordinance, and therefore void and invalid because of lack of antecedent legislative authority conferring upon said Mayor and councilmen power to pass the same.

(4) As so arbitrary, capricious, discriminatory, unreasonable, and subversive of private rights as to be a clear abuse rather than a bona fide exercise of power, and as to deny the plaintiff the equal protection of the laws and due process of law secured to it by the provisions of Section one of the Fourteenth Amendment to the Constitution of the United States, above quoted, and for the same reasons void under the Constitution and Laws of the State of Kansas.

B. For the purpose of procuring an order and decree of this court restraining and permanently enjoining the defendants and each of them from enforcing said void ordinance.

V

Plaintiff, Sinclair Refining Company, is a corporation duly organized and existing under the Laws of the State of Maine, and duly licensed and authorized to engage in business in the State of Kansas as a foreign corporation, and said company now is and was at all times herein mentioned a citizen and resident of the State of Maine and of no other State.

VI

That the defendant City of Marysville, Kansas, is a city of the second class, duly organized and existing under and subject to the Constitution and Laws of the State of Kansas, and therefore is now and at all times hereinafter set forth has been a resident and citizen of the State of Kansas and of the First Division of the District of Kansas, and is not and has not been a resident or citizen of any other State or Federal judicial District.

VII

That the individual defendants herein are the duly elected, qualified and acting officers of the City of Marysville, Kansas, respectively, as set out and shown in the title [fol. 13] of this cause; that each of them is a citizen and resident of the State of Kansas and of the First Division of the United States District Court for the District of Kansas, and is not a resident or citizen of any other State.

VIII

Sinclair Refining Company, among other things is now and has been for many years engaged in the business of storing gasoline, kerosene, distillate and crude oil in large steel tanks constructed above ground, and in selling and distributing said products therefrom in various cities and towns of Kansas and of the United States including the City of Marysville, Kansas; that its storage tanks above ground in Marysville, Kansas, have a capacity of more than 500 gallons each.

IX

That the said storage tanks so used by plaintiff in Marysville, Kansas, are and each of them is constructed, equipped and maintained and operated with the most modern, efficient and best safety appliances and devices known, and said tanks are operated in a careful, sanitary and safe manner.

X

That the storage of said products in said tanks so equipped maintained and operated above ground adjacent

to railroads and railroad switches within cities and towns of the State of Kansas and throughout the United States, including the City of Marysville, Kansas, is and for more than ten years last past has been a safe, useful, convenient and necessary incident and practice of the business of the plaintiffs and of others engaged in the same business, and has been during said period and now is required by modern methods of commerce, transportation and habits of life; that said business has during said period been established, maintained and universally recognized throughout the State of Kansas and the United States as a necessary and legitimate business, and as conducted by the plaintiff in the City of Marysville, Kansas, said business in no way infringes upon, injures or adversely affects the health, morals, safety or welfare of individuals or of the public.

XI

Plaintiff, Sinclair Refining Company, pursuant to its well recognized and established right to carry on the business of storing said products in storage tanks erected above ground, on the 28th of November, 1916, purchased from the [fol. 14] Exchange Bank, of Schmidt and Koester, Lot No. 9, in Block 71 in Marysville, Kansas, which said lot was conveyed to plaintiff by said Bank in fee simple by warranty deed. That at the time of said purchase by plaintiff there were located upon said Lot No. 9 the steel tanks now owned and operated by the plaintiff herein for storing said products above mentioned; that said tanks had been constructed for and used in the storage of said products by plaintiff's predecessor in title, one J. H. Riepen, who was the immediate predecessor in title of the said Exchange Bank; that said J. H. Riepen on the 12th day of September, 1910, was by the Mayor and councilmen of the City of Marysville, Kansas, granted permission and the right to construct said oil tanks above ground on said Lot No. 9 in Block 71 above mentioned, and immediately thereafter erected the oil tanks now in use by the plaintiff herein; that said tanks were in use at the time plaintiff purchased Lot No. 9 and have been in continuous use since their erection by J. H. Riepen to the present time for the purpose of storing therein and distributing therefrom oil and gasoline; that said tanks are

two in number, are 10' 6" in diameter and 18' 7" in height and each has a capacity of approximately 10,000 gallons. The tanks are constructed of steel plates ⅜" in thickness. These plates are riveted together so as to form a cylindrical tank. They are built upon a solid concrete foundation, equipped with man-holes and McDonald vents, which allow the escape of all vapors and gas arising from their contents.

XII

That the nearest building or structure to said tanks is the residence of J. H. Riepen which is located on the south half of Block 71 and is approximately 58 feet distance from said tanks; that said J. H. Riepen occupied said residence in 1910 when he constructed the oil tanks now owned and operated by Sinclair Refining Company, and continued to occupy said residence and to operate said storage tanks until he sold the same; that he has remodeled said residence since said Lot and tanks were sold to the plaintiff; that he still lives in said residence; that while a number of houses have been built in that section of the City of Marysville, Kansas, since said tanks were erected, none of them are in close proximity to or in any way endangered or affected by the use and operation of said tanks in plaintiff's business; that said tanks are still located in a sparcely settled section of the city, on a spur of the Union Pacific Railroad track devoted almost exclusively to freight and mercantile service.

[fol. 15]

XIII

That the storage tanks of the plaintiff in Marysville, Kansas, have been in operation with the knowledge, approval and consent of the defendant city, for their present use and purpose since their erection by J. H. Riepen, for more than 13 years prior to the passage of Ordinance No. 330 without accident or injury to persons or property, and the business connected with the use thereof has been and is being carried on in a sanitary, safe and legitimate way; that in July, 1914 the Mayor and councilmen of the City of Marysville, Kansas, regularly passed and published Ordinance No. 237, Section 4 of which reads as follows:

"Section 4. Tanks may be constructed in the building, if buried at least three feet below the lowest floor thereof,

and isolated tanks, constructed for the storage of gasoline, fuel oil and motor spirits in quantities of 5,000 gallons or more, may be constructed above ground at such locations as the Mayor and City Council may determine. Provided a permit designating the location and manner of construction must be procured from the Mayor and City Council thereof, before the construction of such tanks. Provided further, a permit for the maintenance of isolated tanks built upon the surface and now located within said city, if properly safeguarded, will be issued."

A true and correct copy of said ordinance, marked Exhibit "A," is attached to the original bill of complaint herein and asked to be read as a part hereof.

XIV

That the said storage tanks located on Lot 9, Block 71, in Marysville, Kansas, are outside of the fire limits established by the Mayor and councilmen of the City of Marysville, Kansas.

XV

That the provisions of said Ordinance No. 350 requiring plaintiff to bury its tanks under ground are arbitrary, unreasonable and impossible of performance in that said tanks cannot be buried and that the enforcement of said ordinance will result in the absolute confiscation of plaintiff's property; in an unlawful and unjust discrimination against plaintiff, and in a denial to plaintiff of the equal protection of the laws, and in the deprivation of its property without due process of law, in violation of the Fourteenth Amendment to the Constitution of the United States, above quoted, and of the Constitution and Laws of the State of Kansas.

[fol. 16] XVI

That permits were duly and regularly issued to the plaintiff under and as provided for in said Ordinance No. 237, and that the same remains in force and effect until the passage of Ordinance No. 350 hereinafter referred to.

XVII

That on the 8th day of October, 1923, the Mayor and councilmen of the defendant City passed and published in

so far as they could legally do so, Ordinance No. 350 of the Ordinances of the City of Marysville, Kansas, being the ordinance complained of herein. A true and correct copy of said ordinance, marked Exhibit "B" is attached to the original bill of complaint herein, and asked to be read as a part hereof. That the provisions of said Ordinance No. 350 are discriminatory and deny to this plaintiff the equal protection of the laws under Section one of the Fourteenth Amendment to the Constitution of the United States, in that Section one of said ordinance requires this plaintiff to bury its tanks three feet under ground, while Section Three of said ordinance provides that:

"This ordinance shall in no case apply to the storage of any crude oil, distillate or fuel oil in containers of capacity of 500 gallons or less, but only one such 500 gallon container shall be permitted on each premises, nor shall it apply to the storage of gasoline, kerosene or naptha in quantities of less than ten gallons, all of which commodities in the quantities mentioned and permitted by this section shall be kept and stored in the manner as now provided by existing ordinance."

XVIII

That it is more dangerous from the standpoint of the health and safety of the public to establish, maintain and operate oil tanks of the kind and for the purposes aforesaid under ground than to maintain and operate them above ground in the manner in which the plaintiff is now maintaining and operating the same as aforesaid in the said City of Marysville, Kansas, and elsewhere.

XIX

That said Ordinance No. 350 herein complained of and the enforcement of which is herein sought to be enjoined, prohibits plaintiff from maintaining and operating all storage tanks of the kind and character aforesaid at any point within the corporate limits of the City of Marysville, Kan- [fol. 17] sas, unless the same shall be buried under ground as aforesaid; that said City of Marysville, Kansas, contains within its corporate limits numerous tracts of ground which are wholly vacant and used exclusively for agri-

cultural purposes and each of which is of from one to sixty acres in area; that said ordinance is so arbitrary and unreasonable in its provisions as to prohibit plaintiff from using any one of said numerous tracts to establish, maintain and operate its said business with its tanks thereon above ground, although that could be done without any possible injury or damage to either persons or property.

XX

Plaintiff respectfully shows that said Ordinance No. 350 is so arbitrary and unreasonable that it will drive this plaintiff's business and the business of others similarly engaged from the city limits of the City of Marysville, Kansas, or cause it and them to establish, maintain and operate oil tanks under ground in a manner less safe than that now employed by plaintiff as aforesaid, and if said ordinance is enforced it will result in confiscation of plaintiff's property in violation of the Fourteenth Amendment to the Federal Constitution, herein above quoted and set out, and in violation of the Constitution and Laws of the State of Kansas.

XXI

Your petitioner further shows that the penalties fixed by Section 5 of said ordinance are unreasonable and arbitrary in that they provide that:

"Section 5. Any person, firm or corporation violating any of the provisions of this ordinance shall upon conviction be adjudged to pay a fine of $25.00 for each such violation, and each day that any of the commodities herein referred to are stored in violation of the terms hereof shall constitute a separate and distinct offense hereunder."

XXII

Plaintiff further says that the officers of the City of Marysville, Kansas, hereinbefore named are threatening and attempting to enforce said ordinance; that they have caused the managing agent of this plaintiff to be arrested on a warrant charging him with violation of Ordinance No.

350; that he is subject to and threatened with continual arrests and fines; that the plaintiff has no adequate remedy [fol. 18] at law; that said void ordinance will be enforced against the plaintiff and its officers and agents unless prevented by the equitable order of this court restraining and enjoining said city and each and all of its said officers and agents from enforcing or attempting to enforce said void ordinance.

Wherefore plaintiff prays:

A. That said Ordinance No. 350 of the Ordinances of the City of Marysville, Kansas, be declared and decreed by this court to be arbitrary, unreasonable, discriminatory and void and confiscatory of the plaintiff's property, and in violation of the plaintiff's rights under the Constitution and Laws of the United States and the State of Kansas;

B. That the City of Marysville, Kansas, and Charles F. Travelute, Mayor; Leonard Cole, E. G. Filbert, Ed. Hall, Paul Kirkpatrick, Oscar Terry, T. J. Austin, and Harry Thompson, Councilmen, Edgar C. Bennett, City Attorney; and P. Hayes, Marshal of said City, and each of them on the presentation of this Amended Bill of Complaint be temporarily restrained from enforcing or attempting to enforce said Ordinance No. 350; that this cause be set down for hearing on application for temporary injunction at an early date; that on said hearing a temporary injunction be granted, and that on final hearing said temporary injunction shall be made perpetual.

C. That subpœna shall issue out of this Honorable Court directed to the defendants not heretofore served, to-wit: T. J. Austin and Oscar Terry, requiring and commanding them and each of them to appear in this cause on a day certain, to answer the several allegations of this petition (unless they shall forthwith enter their appearance herein), answer under oath being expressly waived.

D. Plaintiff further prays for such other and further relief in the premises as to this Honorable Court may seem equitable and just.

Thomas F. Doran, Clayton E. Kline, Attorneys for Plaintiff.

Duly sworn to by T. F. Doran. Jurat omitted in printing.

[fol. 19] IN UNITED STATES DISTRICT COURT

[Title omitted]

ORDER FOR CONSOLIDATION AND REFERENCE—Filed Oct. 6, 1924

Now, on this sixth day of October, 1924, the above entitled causes came regularly on for hearing, and it having been shown to the Court that there are questions of fact involved requiring the taking of proofs, and that the issues of fact and law involved are practically identical in each case, the Court thereupon finds that said cases should be consolidated, and that a Master should be appointed herein to take such proofs and to make findings of fact, conclusions of law and recommend the judgments which should be entered herein.

Wherefore it is by the Court ordered that Charles Blood Smith should be and he is hereby appointed Special Master to take the proofs in said causes and that the same be, and [fol. 20] they are hereby consolidated; and that the taking of such proofs shall begin not later than the twentieth day of October, 1924, and that the same shall be concluded with all reasonable speed, and that thereupon the said Master shall, without delay, make findings of fact and conclusions of law, and make this report thereon recommending the judgments to be entered herein.

The taking of such proofs to be held and had within the jurisdiction of this court, at such times and places as shall be convenient to the Master and the parties within the time limits herein fixed.

John C. Pollock, Judge.

[File endorsement omitted]

IN UNITED STATES DISTRICT COURT

(No. 652-N)

ANSWER—Filed Oct. 11, 1924

Come now the defendants above named, and for their joint and several answers to the Bill of Complaint, say:

I

The defendants deny that the matter in controversy herein exceeds the sum, or value, of Three Thousand Dollars ($3,000.), exclusive of interest and costs, and file their motion to dismiss by way of answer, because this Court should not take jurisdiction of this suit, for that the said suit does not really and substantially involve a suit, or controversy, properly within its jurisdiction, for that the allegations, that the matter in controversy exceed the sum or value, of Three Thousand Dollars ($3,000), exclusive of interest and costs, are not truly and in good faith made, but on the contrary are falsely and fictitiously made for the purpose of imposing on the jurisdiction of this court. All of which the defendants aver to be true, and plead the same in bar of the complainant's said bill and pray judgment whether they should answer, and further pray to be hence dismissed with costs.

Further answering:

II

The defendants admit that the cause of action set out arises under the Constitution and laws of the United States.

III

[fol. 21] The defendants admit that there is a diversity of citizenship between the plaintiff and each of the defendants herein.

IV

The defendants admit that the bill is brought for the purpose of procuring an order and decree declaring void

ordinance No. 350, of the ordinances of the city of Marysville, Kansas, and for the purpose of procuring an order and decree perpetually enjoining the defendants and each of them from enforcing said ordinance, and for the reasons set out in paragraph IV of said Bill of Complaint, but specifically deny that said ordinance is in contravention of the rights of the plaintiff under Section 1 of the Fourteenth Amendment to the Constitution of the United States; or that it is repugnant to the rights of the plaintiff, under the common law and the Constitution and laws of the State of Kansas; or that the action of the defendant, The City of Marysville, in passing said ordinance was and is ultra vires; or that said ordinance was, or is, invalid because of lack of antecedent legislative authority conferring power upon said city to pass the same; or that said ordinance is so arbitrary, capricious, discriminatory, unreasonable, and subversive of private rights as to amount to a clear abuse of power and to deny the plaintiff the equal protection of the laws and due process of law secured to it by section 1 of the Fourteenth Amendment to the Constitution of the United States; or that said ordinance is void under the Constitution and laws of the State of Kansas. The defendants allege that full authority for the passing of said ordinance No. 350 has been conferred upon them, and exists under sections 14-401, 14-418, 14-421 and 14-439 of the Revised Statutes of Kansas, 1923, the same having been sections 1704, 1726, 1729 and 1748 of the General Statutes of Kansas for 1915.

V

The defendants admit the corporate existence and citizenship of the plaintiff, and that at all times mentioned it was duly licensed and authorized to engage in business in the State of Kansas as a foreign corporation, all as set out in paragraph V of the Bill of Complaint.

VI

The defendants admit that the City of Marysville is a city of the second class of the State of Kansas, and a resident and citizen of the State of Kansas, and of the First Division of the District of Kansas, all as set out in para-
[fol. 22] graph VI of the Bill of Complaint.

VII

The individual defendants admit that they are the duly elected, qualified and acting officers of the City of Marysville, as set out and shown in the title of the Bill of Complaint, and admit their residence and citizenship, all as set out in paragraph VII of the Bill of Complaint.

VIII

The defendants have no knowledge of the plaintiff having been continuously engaged in the business of selling and storing for sale and distribution various products of petroleum in tanks constructed above ground in any other towns and cities of the State of Kansas, except the City of Marysville, but state that, if such be the fact, it is not a matter of equity entitling plaintiff to the relief prayed for, nor are the facts as stated sufficient to entitle plaintiff to any relief against these defendants; the defendants admit that the plaintiff has for more than ten years last past been continuously engaged in the business of selling and storing for sale and distribution large quantities of gasoline and kerosene in tanks constructed above ground in the City of Marysville, each of which contained more than five hundred (500) gallons.

IX

The defendants deny that the tanks so used by the plaintiff, and each and all of them, are equipped and constructed, maintained and operated with the most modern, efficient, and best safety appliances known, and in a prudent, skillful, and safe manner.

X

The defendants admit that the storage and keeping of petroleum products have been for more than ten years, and now are useful, convenient and necessary incidents of plaintiff's business, and are required by modern methods of commerce, transportation and habits of life, but specifically deny that the storage and keeping of said products in such tanks as the plaintiff has, so equipped, maintained, and operated adjacent to railroads and railroad switches within cities, towns, and within the city of Marysville, Kansas, are

the safe, useful, convenient and necessary incidents and practices of the plaintiff's business, or are required by modern methods of commerce, transportation and habits of life, or have been established, maintained, and universally rec- [fol. 23] ognized throughout the State of Kansas and the United States, as necessary and legitimate means of conducting said business, and deny that said storage and keeping in no way infringes upon, injures, or adversely affects the health, morals, safety, or welfare of individuals or the public in said city of Marysville.

XI

The defendants admit that for more than ten years last past the plaintiff has been transacting its business in the regular course and has maintained and operated tanks for the storage of petroleum products in the city of Marysville upon the premises described in paragraph XI of said Bill of Complaint.

XII

The defendants admit that the storage tanks now upon said premises, or others of similar character and construction, have been maintained and operated upon said premises continuously for more than ten years prior to the passage of ordinance No. 350 of the city of Marysville, and with the knowledge of the defendant city of Marysville, but deny that the same was, or is with the approval and consent of the defendant city, or of the individual defendants. The defendants admit that said tanks have been maintained and operated as alleged without accident in the city of Marysville, but deny that they have been maintained and operated without injury to persons or property, and that their use and maintenance have been, and are now being carried on in a safe, sanitary, and legitimate way.

XIII

The defendants admit that said tanks and places of business of the plaintiff are located upon a spur, or sidetrack, of the Union Pacific Railway Company outside of the fire limits of the City of Marysville, but deny that said tanks are located in a sparsely occupied section of said city, and

that they are not in close proximity to buildings of other persons, firms or corporations, but on the contrary allege that said tanks of the plaintiff are only 1½ blocks distant from the main business street of the city of Marysville, and are surrounded on all sides by residences and other buildings in such close proximity as to endanger the destruction of property and loss of life.

XIV

The defendants admit that in July, 1914, the Mayor and Council of the city of Marysville regularly passed and pub-
[fol. 24] lished ordinance No. 237 of the ordinances of the city of Marysville, and that Section 4, as set out in paragraph XIV of the Bill of Complaint, and exhibit "A" attached to the Bill of Complaint, are true and correct copies of said section 4, and of said ordinance respectively.

XV

The defendants admit that permits were issued to the plaintiff under and as provided for in ordinance No. 237, but state that said permits are void, and are not binding on these defendants, and deny that the same remained in force and effect until the passage of ordinance No. 350 but admit that the first action taken by these defendants with reference thereto was the passage of said ordinance No. 350. Defendants further state that, if the facts be as alleged, they do not state any matter of equity entitling the plaintiff to relief prayed for, nor are the facts as stated sufficient to entitle the plaintiff to any relief against these defendants.

XVI

The defendants admit that on October 8, 1923, the Mayor and Council of the city of Marysville, passed and published ordinance No. 350 of the ordinances of the city of Marysville, and admit that exhibit "B" of the Bill of Complaint is a true and correct copy of said ordinance.

XVII

The defendants deny that ordinance No. 350 is discriminatory, or denies to the plaintiff the equal protection of the

laws under section 1 of the Fourteenth Amendment to the Constitution of the United States for the reasons set out in paragraph XVII of the Bill of Complaint, and allege that the regulation of the keeping and storage of said products in the quantities and under the conditions provided for in said ordinance is fair and reasonable for the proper protection of the health, safety and welfare of the people and the property of the city of Marysville, in that the keeping and storing above ground of gasoline, kerosene, naphtha, distillate, fuel oil, crude oil, or other inflammable or combustible liquids in quantities over five hundred (500) gallons is a menace to the public safety; whereas the keeping and storage above ground of crude oil, distillate, or fuel oil in quantities of five hundred (500) gallons or less on one premises, and of gasoline, kerosene, or naphtha in quantities less than ten (10) gallons is not a menace to public safety.

[fol. 25] XVIII

The defendants deny that the provisions of ordinance No. 350, require the burying under ground of tanks of the "kind and character used by the plaintiff" in the city of Marysville, and allege that said ordinance requires that all tanks, barrels, and containers, in which are kept or stored gasoline, kerosene, naphtha, distillate, fuel oil, or crude oil, or other inflammable or combustible liquid, should be buried at least three feet under ground, except as provided in section 3 of said ordinance, and deny that such provisions of ordinance No. 350 are arbitrary, unreasonable, and impossible of performance; and deny that plaintiff's tanks cannot be operated and maintained when so buried, and that the enforcement of said ordinance will result in the absolute confiscation of the plaintiff's property, but state that, if such be the fact, it does not state any matter of equity entitling plaintiff to the relief prayed for, nor are said facts sufficient to entitle plaintiff to any relief against these defendants.

XIX

Defendants deny that it is more dangerous from the standpoint of the health and safety of the public to establish, maintain, and operate tanks for the storage of petroleum products under ground than above ground.

XX

Defendants admit that ordinance No. 350 prohibits the plaintiff from maintaining and operating tanks for the storage of petroleum products other than crude oil, distillate, or fuel oil, in containers in a capacity of five hundred (500) gallons or less in storage tanks, unless the same be buried under ground as provided in said ordinance.

Defendants admit that the City of Marysville [contained] within its corporate limits numerous tracts of land that are wholly vacant and used exclusively for agricultural purposes, each of which is from one to ten acres in area, but deny that said ordinance is unreasonable and arbitrary in prohibiting the plaintiff from using said tracts otherwise than as provided in said ordinance, and deny that said use can be had without possible injury to the persons and the property, and further aver that the plaintiff's tanks are not located on any of said tracts of ground, and that, if the facts be as alleged, they do not state any matter of equity entitling the plaintiff to the relief prayed for, nor are they sufficient to entitle the plaintiff to any relief against these defendants.

[fol. 26]

XXI

The defendants admit that ordinance No. 350 will require the plaintiff to establish, maintain, and operate its oil tanks under the ground, if it desires to maintain them within the limits of the city of Marysville, but denies that said tanks are less safe than the ones now used by said plaintiff, and denies that said ordinance is arbitrary and unreasonable or that it will drive plaintiff's business from said city limits, or that it will result in the confiscation of the plaintiff's property in violation of the provisions of the Federal Constitution as set out in said Bill of Complaint.

XXII

Defendants admit that section 5, of the ordinance No. 350, as set out in paragraph 22 of the Bill of Complaint, is true and correct, but denies that the penalties affixed therein are unreasonable and arbitrary.

XXIII

Defendants admit that the officers of the city of Marysville attempted to enforce said ordinance and arrest an employee of the plaintiff on a warrant charging him with violation thereof, and admit that said ordinance will be enforced against the plaintiff, its officers, agents and employees unless prevented by the equitable order of this Court.

Wherefore having thus made a full answer to all the matters and things contained in the Bill of Complaint, the defendants and each of them, pray that the bill be dismissed, and for judgment and costs in its behalf incurred.

John S. Dean, Harry W. Colmery, Edgar C. Bennett, Frank H. McFarland, Attorneys for the Defendants.

In United States District Court

(No. 653-N)

Answer—Filed Oct. 11, 1924

Come now the defendants above named, and for their joint and several answers to the Bill of Complaint, say:

[fol. 27] I

The defendants deny that the matter in controversy herein exceeds the sum, or value, of Three Thousand Dollars ($3,000.), exclusive of interest and costs, and file their motion to dismiss by way of answer, because this Court should not take jurisdiction of this suit, for that the said suit does not really and substantially involve a suit, or controversy, properly within its jurisdiction, for that the allegations, that the matter in controversy exceeds the sum or value, of Three Thousand Dollars ($3,000), exclusive of interest and costs, are not truly and in good faith made, but on the contrary are falsely and fictitiously made for the purpose of imposing on the jurisdiction of this court. All of which the defendants aver to be true, and plead the same

in bar of the complainant's said bill and pray judgment whether they should answer, and further pray to be hence dismissed with costs.

Further answering:

II

The defendants admit that the cause of action set out arises under the Constitution and laws of the United States.

III

The defendants admit that there is a diversity of citizenship between the plaintiff and each of the defendants herein.

IV

The defendants admit that the bill is brought for the purpose of procuring an order and decree declaring void ordinance No. 350, of the ordinances of the city of Marysville, Kansas, and for the purpose of procuring an order and decree perpetually enjoining the defendants and each of them from enforcing said ordinance, and for the reasons set out in paragraph IV of said Bill of Complaint, but specifically deny that said ordinance is in contravention of the rights of the plaintiff under Section 1 of the Fourteenth Amendment to the Constitution of the United States; or that it is repugnant to the rights of the plaintiff, under the common law and the Constitution and laws of the State of Kansas; or that the action of the defendant, The City of Marysille, in passing said ordinance was and is ultra vires or that said ordinance was, or is, invalid because of lack of antecedent legislative authority conferring power upon said city to pass the same; or that said ordinance is so arbitrary, capricious, discriminatory, unrea- [fol. 28] sonable, and subversive of private rights as to amount to a clear abuse of power and to deny the plaintiff the equal protection of the laws and due process of law secured to it by section 1 of the Fourteenth Amendment to the Constitution of the United States; or that said ordinance is void under the Constiution and laws of the State of Kansas. The defendants allege that full au-

thority for the passing of said ordinance No. 350 has been conferred upon them, and exists under sections 14-401, 14-418, 14-421 and 14-439 of the Revised Statutes of Kansas, 1923, the same having been sections 1704, 1726, 1729 and 1748 of the General Statutes of Kansas for 1915.

V

The defendants admit the corporate existence and citizenship of the plaintiff, and that at all times mentioned it was duly licensed and authorized to engage in business in the State of Kansas as a foreign corporation, all as set out in paragraph V of the Bill of Complaint.

VI

The defendants admit that the City of Marysville is a city of the second class of the State of Kansas, and a resident and citizen of the State of Kansas, and of the First Division of the District of Kansas, all as set out in paragraph VI of the Bill of Complaint.

VII

The individual defendants admit that they are the duly elected, qualified and acting officers of the City of Marysville, as set out and shown in the title of the Bill of Complaint, and admit their residence and citizenship, all as set out in paragraph VII of the Bill of Complaint.

VIII

The defendants have no knowledge of the plaintiff having been continuously engaged in the business of selling and storing for sale and distribution various products of petroleum in large steel tanks constructed above ground and in selling and distributing said products therefrom in any other towns and cities of the State of Kansas, and of the United States, except the City of Marysville but state that, if such be the fact, it is not a matter of equity entitling the plaintiff to the relief prayed for, nor are the facts as stated sufficient to entitle plaintiff to any relief against these defendants; the defendants admit that plain-

[fol. 29] tiff's tanks constructed above ground in the City of Marysville, each have a capacity of more than five hundred (500) gallons.

IX

The defendants deny that the tanks so used by the plaintiff and each and all of them, are equipped and constructed, maintained and operated with the most modern, efficient, and best safety appliances and devices known, and in careful, sanitary, skillful and safe manner.

X

The defendants admit that the storage and keeping of petroleum products have been for more than ten years, and now are, useful, convenient, and necessary incidents of plaintiff's business, and of others engaged in the same business, and are required by modern methods of commerce, transportation and habits of life, but specifically deny that the storage and keeping of said products in such tanks as the plaintiff has, so equipped, maintained and operated adjacent to railroads and railroad switches within cities, towns, and within the city of Marysville, Kansas, are the safe, useful, convenient, and necessary incidents and practices of the plaintiff's business, or are required by modern methods of commerce, transportation and habits of life, or have been established, maintained, and universally recognized throughout the State of Kansas, and the United States, as necessary and legitimate means of conducting said business, and deny that said storage and keeping as conducted by plaintiff in the City of Marysville, in no way infringes upon, injures or adversely affects the health, morals, safety or welfare of individuals or the public in said City of Marysville.

XI

The defendants admit the purchase and ownership of Lot Nine (9), in Block Seventy-one (71), of the City of Marysville, and that at the time of said purchase the steel tanks now owned and operated by plaintiff were located thereon, and that said tanks had been constructed and used by plaintiff's predecessor in title under permission granted

by the Mayor and Councilmen of the city of Marysville, all as set out in paragraph XI of the Bill of Complaint, but state that said permission was and is void and not binding on these defendants. Defendants admit that plaintiff's tanks have been in continuous use since their erection to the present time, and are of the number, dimensions, capacity, and construction as set out in paragraph XI of the Bill of [fol. 30] Complaint, except that defendants have no knowledge as to said tanks being equipped with man-holes and McDonald vents, admitting that if so equipped, they are intended to allow the escape of all vapors and gas arising from their contents, but denying that they do allow such escape.

XII

The defendants admit that the residence of J. H. Riepen is located on the South half of Block Seventy-one (71), and is approximately fifty-eight (58) feet distant from said tanks, but deny that it is the nearest structure to said tanks; admit the occupancy and remodeling of said residence as alleged, admit that a number of houses have been built in that section of the City of Marysville since said tanks were erected, but deny that none of said houses is in close proximity to or in any way endangered or affected by the use and operation of said tanks in plaintiff's business, and that said tanks are located in a sparsely settled section of said city, but on the contrary allege that said tanks are only one and one-half (1½) blocks distant from the main business street of the City of Marysville, and are surrounded on all sides by residences and other buildings in such close proximity as to endanger the destruction of property and the loss of life.

XIII

The defendants admit that the storage tanks of the plaintiff have been maintained and operated upon said premises continuously for more than thirteen years prior to the passage of ordinance No. 350 of the city of Marysville, and with the knowledge of the defendant city of Marysville, but deny that the same was, or is with the approval and consent of the defendant city, or of the individual defendants. The defendants admit that said tanks have been maintained

and operated as alleged without accident in the city of Marysville, but deny that they have been maintained and operated without injury to persons or property, and that their use and maintenance have been, and are now being carried on in a safe, sanitary, and legitimate way. The defendants admit that in July, 1914, the Mayor and Council of the City of Marysville regularly passed and published ordinance No. 237 of the ordinances of the city of Marysville, and that section 4, as set out in paragraph XIII of the Bill of Complaint, and exhibit "A" attached to the Bill of Complaint, are true and correct copies of said section 4, and of said ordinance, respectively.

[fol. 31]

XIV

The defendants admit that the storage tanks on Lot Nine (9) Block Seventy-one (71), are outside of the fire limits established by the Mayor and Councilmen of the City of Marysville, Kansas.

XV

The defendants deny that the provisions of ordinance No. 350 require the burying under ground of plaintiff's tanks and allege that said ordinance requires that all tanks, barrels and containers, in which are kept or stored gasoline, kerosene, naphtha, distillate, fuel oil, or crude oil, or other inflammable or combustible liquid, should be buried, at least three feet under ground, except as provided in section 3 of said ordinance, and deny that such provisions of ordinance No. 350 are arbitrary, unreasonable, and impossible of performance; and that the enforcement of said ordinance will result in the absolute confiscation of the plaintiff's property, but state that, if such be the fact, it does not state any matter of equity entitling plaintiff to the relief prayed for, nor are said facts sufficient to entitle plaintiff to any relief against these defendants, and deny that said ordinance is an unlawful and unjust discrimination against plaintiff or denies it the equal protection of the laws as alleged in paragraph XV of the Bill of Complaint.

XVI

The defendants admit that permits were issued to the plaintiff under and as provided for in ordinance No. 237,

but state that said permits are void, and are not binding on these defendants, and deny that the same remained in force and effect until the passage of ordinance No. 350, but admit that the first action taken by these defendants with reference thereto was the passage of said ordinance No. 350. Defendants further state that, if the facts be as alleged, they do not state any matter of equity entitling the plaintiff to relief prayed for, nor are the facts as stated sufficient to entitle the plaintiff to any relief against these defendants.

XVII

The defendants admit that on October 8, 1923, the Mayor and Council of the city of Marysville, passed and published ordinance No. 350 of the ordinances of the city of Marysville, and admit that exhibit "B" of the Bill of Complaint is a true and correct copy of said ordinance. The defendants deny that ordinance No. 350 is discriminatory, or de- [fol. 32] nies to the plaintiff the equal protection of the laws under section 1 of the Fourteenth Amendment to the Constitution of the United States for the reasons set out in paragraph XVII of the Bill of Complaint, and allege that the regulation of the keeping and storage of said products in the quantities and under the conditions provided for in said ordinance is fair and reasonable for the proper protection of the health, safety, and welfare of the people and the property of the city of Marysville in that the keeping and storing above ground of gasoline, kerosene, naphtha, distillate, fuel oil, crude oil, or other inflammable or combustible liquids in quantities over five hundred (500) gallons is a menace to the public safety; whereas the keeping and storage above ground of crude oil, distillate, or fuel oil in quantities of five hundred (500) gallons or less on one premises, and of gasoline, kerosene, or naphtha, in quantities less than (10) gallons is not a menace to public safety.

XVIII

Defendants deny that it is more dangerous from the standpoint of the health and safety of the public to establish, maintain and operate tanks for the storage of petroleum products under ground that above ground in the

manner in which said tanks are operated by plaintiff in the City of Marysville.

XIX

Defendants admit that ordinance No. 350 prohibits the plaintiff from maintaining and operating tanks for the storage of petroleum products other than crude oil, distillate, or fuel oil, in containers in a capacity of five hundred (500) gallons or less in storage tanks, unless the same be buried under ground, as provided in said ordinance.

Defendants admit that the City of Marysville [contained] within its corporate limits numerous tracts of land that are wholly vacant and used exclusively for agricultural purposes, each of which is from one to ten acres in area and that there is one tract of approximately sixty (60) acres, but deny that said ordinance is unreasonable and arbitrary in prohibiting the plaintiff from using said tracts otherwise than as provided in said ordinance, and deny that said use can be had without possible injury to the persons and property, and further aver that the plaintiff's tanks are not located on any of said tracts of ground, and that, if the facts be as alleged, they do not state any matter of equity entitling the plaintiff to the relief prayed for, nor are they [fol. 33] sufficient to entitle the plaintiff to any relief against these defendants.

XX

The defendants admit that ordinance No. 350 will require the plaintiff to establish, maintain, and operate its oil tanks under the ground, if it desires to maintain them within the limits of the city of Marysville, but denies that said tanks are less safe than the ones now used by said plaintiff, and denies that said ordinance is arbitrary and unreasonable, or that it will drive plaintiff's business from said city limits, or that it will result in the confiscation of the plaintiff's property in violation of the provisions of the Federal Constitution and the Constitution and laws of the State of Kansas, as set out in said Bill of Complaint.

XXI

Defendants admit that section 5 of the ordinance No. 350 as set out in paragraph XXII of the Bill of Complaint, is

true and correct, but deny that the penalties affixed therein are unreasonable and arbitrary.

XXII

Defendants admit that the officers of the City of Marysville attempted to enforce said ordinance and arrest an employee of the plaintiff on a warrant charging him with violation thereof, and admit that said ordinance will be enforced against the plaintiff, its officers, agents, and employees, unless prevented by the equitable order of this Court.

Wherefore, having thus made a full answer to all the matters and things contained in the Bill of Complaint, the defendants, and each of them, pray that the bill be dismissed, and for judgment and costs in its behalf incurred.

John S. Dean, Harry W. Colmery, Edgar C. Bennett, Frank H. McFarland, Attorneys for the Defendants.

In United States District Court

Findings of Fact and Conclusions of the Special Master —Filed Jan. 24, 1925

From the pleadings, the admission of the parties and the evidence in this case, the Master makes and finds the following to be the facts:

[fol. 34] Findings of Fact

I

That the plaintiff, Standard Oil Company, is now, and at the commencement of this action was, a corporation duly chartered, organized and existing under and by virtue of the laws of the State of Indiana, and was then and is now a citizen of the State of Indiana, duly authorized to engage in business as a foreign corporation in Kansas.

II

That the defendants and each of them are now and at the commencement of this action were residents and citizens of the State of Kansas and of the First Division of the District of Kansas.

III

That the defendant, the City of Marysville, Kansas, is now, and at the time of the commencement of this action was, a city of the second class of and under the laws of the State of Kansas.

IV

That each of the defendants other than the City of Marysville is now and at the time of the commencement of this action was a duly elected, qualified and acting officer of and for the defendant, the City of Marysville, respectively, as set forth in the caption or title to this cause.

V

That the amount in controversy herein, exclusive of interest and costs, exceeds the sum or value of Three Thousand Dollars ($3,000.00).

VI

That said plaintiff was, at the time of the commencement of this action, and for more than twenty years prior thereto had been, continuously in possession of the following-described real estate situate in the City of Marysville, State of Kansas, to-wit:

"Beginning at a point that is in the south-east corner of Lot Twelve, Block Forty, Original Town of Marysville, Kansas, thence north along east line of said Lot Twelve seventy-one feet to a point; thence west at right angles to initial course forty-four and three-tenths feet to a point distant eight and five-tenths feet easterly from center line [fol. 35] of west leg of Old Wye Track of Manhattan Branch, at right angles thereto; thence southwesterly parallel to and distant eight and five-tenths feet from center line of said Wye track, seventy-four and five-tenths feet to the south line of said Block Forty; thence east along said south line of said Block Forty seventy-two and two-tenths feet to point of beginning, in Marshall County, Kansas.

VII

That the real estate occupied by said plaintiff in the City of Marysville, Kansas, is now, and during all the time same

has been occupied by said plaintiff as herein set forth, was owned by the Union Pacific Railroad Company and occupied as aforesaid by said plaintiff under and by virtue of a lease of and from said owner.

VIII

That said plaintiff at the time of the commencement of this action, and for more than twenty years prior thereto, maintained a storage station upon the real estate hereinbefore described for the purpose of there keeping and storing gasoline, kerosene and other products of petroleum.

IX

That said plaintiff moved upon the real estate hereinbefore described in Marysville, Kansas, and there erected a plant and tanks for the keeping and storing of gasoline and kerosene more than twenty years prior to the commencement of this action and with the knowledge and consent of the defendant, the City of Marysville.

X

That the right or authority of said plaintiff to move upon said real estate or to erect and maintain there its storage tanks and use same for the storage of gasoline and kerosene was never denied or questioned by the defendant, the City of Marysville, until on, to wit the eighth day of October, 1923, although an ineffective attempt was made about two years prior to said date to pass an ordinance somewhat similar in purport to Ordinance No. 350 of the City of Marysville.

XI

That the City of Marysville, through its Mayor and Councilmen, on the 8th day of October, 1923, passed and thereafter published and made effective Ordinance No. 350 of said City, which is in words and figures as follows, to-wit:

[fol. 36] Ordinance No. 350

An ordinance regulating the storage of gasoline, kerosene, naptha, distillate, fuel oil, crude oil, and other inflammable and combustible liquids within the city of Marysville, Kansas, and repealing Ordinance No. 333 and Section 4 of Ordinance No. 237.

Be it ordained by the Mayor and Council of the City of Marysville, Kansas:

Section 1. It shall be unlawful for any person, firm or corporation to keep or store within the corporate limits of the city of Marysville, Kansas, and gasoline, kerosene, distillate, fuel oil, crude oil, or other inflammable or combustible liquid otherwise than in tanks, barrels or other containers which shall be buried at least three feet under ground.

Sec. 2. Any person, firm or corporation who shall maintain any underground tank-yard shall keep same fenced securely and shall keep at least six inches of gravel, chat, cinders or other large aggregate over the said area so occupied by tanks, and shall keep and maintain such tank-yard in a clean, orderly manner, free from rubbish, weeds, trash or other inflammable substances.

Sec. 3. This ordinance shall in no case apply to the storage of any crude oil, distillate or fuel oil in containers of a capacity of 500 gallons or less, but only one such 500 gallon container shall be permitted on each premises, nor, shall it apply to the storage of gasoline, kerosene or naphtha in quantities of less than ten gallons, all of which commodities in the quantities mentioned and permitted by this section shall be kept and stored in the manner as now provided by existing ordinance.

Sec. 4. Ordinance No. 333 and Section 4 of Ordinance No. 237 are hereby expressly repealed.

Sec. 5. Any person, firm or corporation violating any of the provisions of this ordinance shall upon conviction be adjudged to pay a fine of $25.00 for each such violation, and each day that any of the commodities herein referred to are stored in violation of the terms hereof shall constitute a separate and distinct offense hereunder.

Sec. 6. Any person, firm or corporation now storing any of the commodities herein mentioned in a manner otherwise than that herein provided shall be given until the 10th day

of November, 1923, in which to bring themselves within the provisions hereof and comply herewith.

[fol. 37] Sec. 7. This ordinance shall be in force and take effect from and after its publication in the official city paper.

Passed and approved this 8th day of October, 1923.

C. F. TRAVELUTE, Mayor.

Attest: By S. Clark, City Clerk. (Seal.)

(Published in the Advocate-Democrat Oct. 11, 1923.)

That the Mayor and Councilmen of the City of Marysville, theretofore, on the 13th day of July, 1914, passed and published ordinance No. 237, which is in words and figures as follows, to-wit:

Ordinance No. 237

An Ordinance Providing for the Storage of Gasoline, Fuel, Motor Spirits Within the City of Marysville

Be it ordained by the Mayor and Councilmen of the City of Marysville, Kansas:

Section 1. That it shall be unlawful for any person to keep or permit to be kept in any building or upon any premises within the City of Marysville, Kansas, more than five gallons of gasoline, fuel oil, or motor spirits, in any one container, and not to exceed two containers on such premises.

Sec. 2. Any person desiring to store a large quantity shall provide a storage tank, which shall be located under ground, except as hereinafter provided, and shall conform to the regulations herein contained.

Sec. 3. All tanks located under ground shall have the top of tank at least two feet below the surface of the ground, and below the level of the lowest pipe in the building to be supplied. Such tank shall be set on a firm foundation, surrounded by soft earth or sand, well tamped in place, or be encased in concrete. A permit for all tanks now located underground within said city, if properly safeguarded, will be issued.

Sec. 4. Tanks may be constructed in the building, if buried at least three feet below the lowest floor thereof, and isolated tanks, constructed for the storage of gasoline, fuel oil and motor spirits, in quantities of 5,000 gallons or more, may be constructed above ground at such locations as the Mayor and City Council may determine, Provided, a permit designating the location and manner of construction must be procured from the Mayor and City Council therefor before the [fol. 38] construction of such tanks. Provided, further, a permit for the maintaintenance of isolated tanks built upon the surface and now located within said city, if properly safeguarded, will be issued.

Sec. 5. That any person violating any provision of this ordinance shall be subject to a fine of not less than five dollars nor more than twenty-five dollars, and be imprisoned until such fine and costs are paid.

Sec. 6. The word "person" in this ordinance shall be considered to include the owners, occupants, and agents of the owner or occupants of premises within said city.

Sec. 7. That all ordinances or parts of ordinances in conflict with this ordinance be and the same are hereby repealed.

Sec. 8. This ordinance shall take effect and be in force from and after its passage and publication in the official city paper.

Passed by the Council and approved by the Mayor this 13th day of July, A. D., 1914.

Chas. F. Pusch, Mayor.

Attest: T. C. Randolph, City Clerk. (Seal.)

That Section 4 of said Ordinance No. 237 was repealed by Ordinance No. 350, as is shown on the face thereof.

XII

That the real estate and premises upon which both of said plaintiffs' storage tanks and business are located in the City of Marysville, Kansas, as aforesaid, are not now, and never have been, within the fire limits prescribed by the City of Marysville.

XIII

That upon the real estate so occupied by said plaintiff in the City of Marysville as aforesaid, and as a means of keeping and storing there gasoline and kerosene, said plaintiff now maintains and has continuously maintained for more than twenty years prior to the commencement of this action, two steel, horizontal tanks, each with a capacity of approximately 17,000 gallons, and each of which rests above the surface of the grounds on concrete piers eighteen inches high and extending forty-eight inches into the earth.

[fol. 39]

XIV

That in each of said tanks so maintained by said plaintiff as aforesaid upon said real estate, said plaintiff keeps and stores, and for more than twenty years prior to the commencement of this action has continuously kept and stored, gasoline and kerosene in quantities of more than ten gallons.

XV

That each of said storage tanks so owned and maintained by said plaintiff in the City of Marysville as aforesaid is equipped with a two-inch McDonald duplex vent and an eighteen-inch man-hole vent, as well as an efficient lightning arrester and grounding device.

XVI

That both of the venting devices with which each of said plaintiff's said tanks is equipped as aforesaid are in the top of the tank and they are sufficient to carry off any vapor arising from the liquid contents of the tank even when same is subject to extreme heat.

XVII

That each of said plaintiff's tanks was, at the time of the commencement of this action, and for more than twenty years prior thereto had continuously been, equipped with the best and most efficient safety devices and were operated in a careful and efficient manner.

XVIII

That there has never been any fire, accident or explosion of any kind or character at or in the tanks or place of business of said plaintiff in the city of Marysville.

XIX

That there has never been any fire, accident or explosion in the city of Marysville, Kansas, of any tank similar in character to the tanks so maintained as aforesaid by said plaintiff in said city.

XX

That no complaint was ever made of or fault found with the construction, equipment or the manner of operation of said plaintiff's tanks, or either of them.

XXI

That the construction of each of said plaintiff's tanks and the equipment and manner of operation thereof are [fol. 40] standard and of the kinds and character generally employed by said plaintiff in the conduct of its business at all points other than the city of Marysville.

XXII

That said plaintiff has and maintains more than twelve thousand tanks similar to its tanks in Marysville and during the five years last past has had therein and thereof sixty-six fires and no more.

XXIII

In only one of the sixty-six fires so had during the past five years as aforesaid in or about said plaintiff's said tanks numbering more than twelve thousand, has any such tank exploded, and in only one instance (being the same fire) has the fire from a tank spread to or injured other property or persons.

XXIV

That the fire at plaintiff's place of business in Hays, Kansas, in November, 1919, is the only one that said plaintiff

has had within five years in the maintenance and operation of more than twelve thousand tanks in which a tank has exploded, or in which fire from a tank has spread to or injured either the property or person of others.

XXV

That the tank of said plaintiff which exploded during the fire in Hays, Kansas, November 17, 1910, was equipped with a two-inch McDonald duplex vent, but was not equipped with a manhole vent similar to the manhole vent with which each of the tanks of said plaintiff at Marysville, Kansas, is equipped.

XXVI

There is no evidence in this case tending to show that any tank similar in construction, equipment, and manner of operation to those maintained by said plaintiff at Marysville, Kansas, as aforesaid, ever exploded or that fire from any such tank ever spread to or otherwise injured either the property or the safety of others.

XXVII

That said storage tanks so maintained and operated by said plaintiff as aforesaid in the City of Marysville cannot be operated if buried as required by the provisions of said ordinance No. 350.

[fol. 41] XXVIII

That the burying by said plaintiff if tanks equal in capacity to those so maintained by it as aforesaid in the City of Marysville as required by said Ordinance No. 350 would be attended with hazards which would render the maintenance and operation thereof underground more dangerous to property and persons than the maintenance and operation of said plaintiff's present tanks above ground.

XXIX

That the above described location of said plaintiff's business and tanks in the City of Marysville as aforesaid is in a sparsely populated portion of said city.

XXX

That there are no changed conditions in the buildings or improvements around the tanks and premises of said plaintiff aforesaid, or in that vicinity, which would warrant or justify that said tanks should be buried as required by said Ordinance No. 350.

XXXI

That each of said tanks so operated and maintained by said plaintiff in the City of Marysville and equipped with the venting devices aforesaid is safe from the standpoint of the public safety and does not present a greater fire hazard than would a frame building or a stock of groceries in a frame building at the same location.

XXXII

That the dwelling house in Marysville situated the closest to said tanks of said plaintiff is more than ninety-eight feet distant.

XXXIII

That the dwelling house closest to said tanks and place of business of said plaintiff in the City of Marysville, Kansas, has been in its present location for more than fourteen years.

XXXIV

That the above described real estate on which said plaintiff maintains its said storage station is upon the right-of-way of the Union Pacific Railroad Company.

[fol. 42]

XXXV

That there are now and during most of the time that said plaintiff has maintained its said storage station in said location in the City of Marysville there have been large quantities of cinders used for ballast upon the track of the Union Pacific Railway Company, which is about twenty feet from said plaintiff's said station.

XXXVI

That the action of water upon cinders creates an acid that corrodes and otherwise injures steel.

XXXVII

That the natural flow and drainage is from the said railroad track of the Union Pacific Railway Company upon and over the property so occupied by said plaintiff as aforesaid in the City of Marysville.

XXXVIII

That there are numerous above-ground tanks in the City of Marysville, Kansas, containing one hundred to five hundred gallons of distillate and fuel oil which are maintained under the authority of said Ordinance No. 350 above ground in close proximity to frame residences and business building.

XXXIX

That under the provisions of said ordinance No. 350 any quantity of crude oil less than five hundred gallons may be stored in tanks above ground in any part of the City of Marysville.

XL

That crude oil is more dangerous from the standpoint of public safety than is gasoline or kerosene and presents a greater hazard.

XLI

That under the provisions of Section One of said Ordinance No. 237 of the City of Marysville, still in force, and by reference adopted by Ordinance No. 350, not more than five gallons of gasoline, fuel oil or motor spirits can be stored or kept above ground in any building or upon any premises within the City of Marysville in any one container, and not to exceed two containers may be kept on any one premises; while under the provisions of Section Three of said Ordinance No. 350, the quantity of gasoline, kerosene

[fol. 43] or naphtha which can be stored or kept above ground must be and is less than ten gallons.

XLII

That under the provisions of Ordinances No. 237 and No. 350 of the City of Marysville, it is unlawful for any citizen of the City of Marysville to keep more than five gallons of gasoline in the tank of his automobile, and every garage-keeper in Marysville who stores cars the tanks of which contain gasoline is guilty of an offense under both of said ordinances and subject to the penalties thereof.

XLIII

That the provisions of Ordinances No. 237 and No. 350 permit and authorize a discrimination particularly in favor of those who desire to keep and store crude oil, distillate and fuel oil in quantities less than five hundred gallons above ground and against those who wish to keep and store crude oil, distillate and fuel oil in quantities of 501 gallons or more above ground, and against those who wish to store and keep ten gallons of gasoline, fuel oil or motor spirits on their premises in one container above ground, and against those who wish to keep and store ten gallons or more of gasoline, kerosene or naphtha above ground in the City of Marysville.

XLIV

That during all the time said plaintiff has occupied the premises aforesaid in the City of Marysville, Kansas, it there transacted its business of keeping and storing and selling petroleum products and sold therefrom during the year 1923 petroleum products aggregating in value the sum of $10,797.27, and during the year 1922, $20,402.31.

XLV

That it is more dangerous from the standpoint of public safety to keep and store gasoline or kerosene in quantities of ten thousand gallons or more under the ground than it is to store the same quantities thereof above ground.

XLVI

That the defendant, the City of Marysville, has caused the arrest of an agent of said plaintiff for the keeping and storing of gasoline and kerosene in said tanks as aforesaid in alleged violation of said Ordinance No. 350 of [fol. 44] the City of Marysville, and will, unless enjoined by decree of this Court, continue to arrest said plaintiff's employes therefor and thereunder and to endeavor to enforce the penalties of said ordinance, to-wit, $25.00 per day for each day that said plaintiff continues to transact its business by the use of said storage tanks so placed as aforesaid above the ground.

XLVII

That the provisions of Sections 1 and 3 of said Ordinance No. 350 and each and all parts thereof are arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of said plaintiff herein.

XLVIII

That the plaintiff, Sinclair Refining Company, is now, and at the commencement of this action was, a corporation duly chartered, organized and existing under and by virtue of the laws of the State of Maine, and duly licensed to do business in the State of Kansas, and was then and is now a citizen of the State of Maine.

XLIX

That the defendant, the City of Marysville, is a municipal corporation, a city of the second class under the laws of the State of Kansas, and therefore a citizen and resident of the State of Kansas, and of the First Division of the United States District Court for the District of Kansas; that each of the other defendants is now and was at the commencement of this action a resident and citizen of the State of Kansas, and of the First Division of the United States District Court for the District of Kansas, and that each individual defendant is an officer of the City of Marysville, Kansas, as respectively designated in the title to this action.

I

That the amount in controversy herein, exclusive of interest and costs, exceeds the sum and value of Three Thousand Dollars ($3,000.00.)

LI

That the plaintiff, the Sinclair Refining Company, was at the time of the commencement of this action and had been for approximately fourteen years prior thereto, the owner and in possession of the following-described real estate, situated in the City of Marysville, Marshall County, Kansas, [fol. 45] to-wit: Lot number Nine (9) in Block Seventy-one (71), in said City of Marysville.

LII

That said plaintiff at the time of the commencement of this action, and for approximately fourteen (14) years prior thereto, had owned, maintained and operated two storage tanks on the above-described property, each with a capacity of approximately twelve thousand (12,000) gallons; that one of said tanks is used for the storage of gasoline and the other for the storage of kerosene.

LIII

That each of said tanks is equipped with proper, sufficient and efficient venting devices, consisting of an improved device known as a 2-inch McDonald Duplex Vent and a manhole eighteen inches in diameter, with an adjustable cover, which, under pressure, automatically forms a vent of sufficient capacity to care for all excess vapors which cannot be taken care of by the McDonald Vent, even under conditions of extreme heat; that said vents were at the time of the commencement of this action, and long prior thereto were, and are now, kept and maintained in good working order and condition; that the connections, pipes, cut-offs and equipment for filling said storage tanks from tank-cars on adjacent railway tracks, and for removing from said storage tanks the contents thereof, and for filling distribution tank wagons, were at the time of the beginning of this action, had been long prior thereto and now are, generally

recognized as approved, efficient, sufficient and safe equipment for the purposes for which they were intended, have been and are now used; that said storage tanks and all the equipment connected and used therewith were constructed and are maintained and operated in first-class condition, carefully, prudently and safely.

LIV

That said plaintiff's storage tanks have at all times since their construction been operated carefully, prudently and safely, without fire, explosion or accident of any kind.

LV

That said tanks were constructed under authority duly granted by the Mayor and Councilmen of the City of Marysville, Kansas, and have been maintained and operated with the full knowledge and consent of said City of Marysville, without complaint or criticism from said city, its officers or [fol. 46] agents, and without special regulation, until the passage of the ordinance herein complained of.

LVI

That each of said plaintiff's storage tanks has a capacity of more than 500 gallons, and that each since its erection has at all times been maintained above ground.

LVII

That each of said storage tanks of the plaintiff, Sinclair Refining Company, is an upright or vertical tank, and is constructed of steel, on a concrete base.

LVIII

That each of said tanks is not so constructed that it can be buried as required by the provisions of said Ordinance No. 350.

LIX

That compliance with the requirements of said ordinance No. 350 would result in almost a total loss of said plaintiff's present tanks and equipment, as the same would have to be disposed of for junk.

LX

That the burying of said plaintiff's tanks, or new tanks of equal capacity, as required by Ordinance No. 350, would be attended by hazards which would render the maintenance and operation of such tanks underground more dangerous to property and persons than the maintenance and operation of said plaintiff's present tanks above ground.

LXI

(a) That the tanks of the Sinclair Refining Company are located slightly west of the Center of the South Half of Block 71; north of said tanks a distance of approximately 10 feet is the warehouse of the Sinclair Company, used for the storage of greases, lubricating oils, and into which is pumped gasoline and kerosene where they are loaded into the tank wagons, and in the small lean-to on the west side of said warehouse there are housed gasoline engine pumps for that purpose.

(b) Facing west and about midway of the South half of Block 71, and on the extreme west side thereof, is the frame residence of J. H. Riepen, which is distant from the tanks of the Sinclair Company 58 feet. For a number of years prior to the erection of said tanks said residence has [fol. 47] existed at said location and has been occupied continuously by J. H. Riepen as his residence up to the present time. Immediately back of his residence there are two small frame out-buildings, 16 feet distant from the Sinclair tanks, and on the north-east corner of said property is a frame barn or shed, 27 feet from the Sinclair warehouse, and immediately across the alley north from this barn are several other frame sheds.

(c) That across the spur tracks, a distance of 62 feet from the Sinclair tanks, are two upright storage tanks of the Derby Oil Company, east of and in close proximity to which is the warehouse of said Company; that further east are two upright storage tanks of the Cities Service Oil Company, a distance of 110 feet from the Sinclair tanks, and immediately north and a few feet distant is the warehouse of the Cities Service Company.

(d) That along the right-of-way of the Union Pacific Railroad Company in Block 71, and on the east side of the spur track, extending north-east and south-west of and across the alley dividing said Block, there is a coal-shed of the Bone-McLucas Lumber Company, 130 feet in length and 16 feet wide, of wooden construction, the south-west corner of which is approximately 75 feet from the Sinclair tanks, about the same distance from the tanks of the Cities Service Company, and about 60 feet from the tanks of the Derby Oil Company. In this coal-shed is stored large quantities of coal.

(e) In the North Half of Block 71, toward the west and facing north on Spring Street, is a two-story frame residence 166 feet from the Sinclair tanks; east of that there is another frame residence, immediately east of which is the warehouse and truck-house of the Fenwick Oil Company, together with the three storage tanks of that Company buried underground.

(f) In Block 50, lying directly north of Block 71, the south half is occupied by four residences, two of which face south on Spring Street and two east on Sixth Street, together with three out-buildings, barns, garages, etc.; and in the north half of Block 50 there are four residences, three facing north on Walnut Street and one facing east on Sixth Street, together with five barns, garages and out-buildings.

(g) In Block 51, lying northeast of Block 71, the Union Pacific Railroad occupies a diagonal strip from 60 to 80 feet in width. In addition, the north half of Block 51 contains four residences, two facing north on Walnut Street, [fol. 48] one facing east on Seventh Street and a new house under construction facing north on Walnut Street, together with six garages, barns, and out-buildings. The south half of Block 51 contains, in addition to the railroad right-of-way, a large ice plant in the south-west corner thereof, of frame construction, 100x42 feet, with an addition of 30x30 feet, each of which is a barn, and in the north-west corner there is a carpenter shop, and facing east on Seventh Street is a residence with one out-building.

(h) In Block 70, lying east of Block 71, there are two residences in the north half, and three residences and two

barns, garages and out-buildings in the south half, one of which is in the north-west corner facing west on Sixth street, and another near the south-west corner facing south on Oak Street.

(i) In Block 83, lying diagonally across Sixth Street and south-east of Block 71, is a large frame residence in the north-west corner, immediately south and a little west of which, but upon the same lot, there is a large barn; and there are houses on each lot adjacent to Sixth Street from Oak to South Streets with the possible exception of one or two lots in Block 83.

(j) In Block 82, which lies immediately south of Block 71, there is in the north-east corner, facing on Oak Street a frame residence 99½ feet south of the Cities Service Company's tanks, and a greater distance from the tanks of the Sinclair Company and west of said residence, facing north on Oak Street is another frame residence 105½ feet south of the tanks of the Derby Oil Company, and a greater distance from the tanks of the Sinclair Company.

(k) In Block 72, lying west of Block 71, there is in the south half thereof a residence facing east on Fifth Street, a distance of 200 feet from the Sinclair Company's tanks; and in the north half of said Block there is a two-story frame residence facing east on Fifth Street, with two barns lying west and south of the same.

(l) In Block 49, diagonally north-west of Block 71, on the south half thereof are four frame residences, two facing east on Fifth Street and two facing south on Spring Street; and in the north half of said Block there are four frame residences, two facing east on Fifth Street and two facing north on Walnut Street.

(m) That there are six lots in the south half of each Block. The south half of Block 71 has five occupancies and [fol. 49] a railroad right-of-way; the north half of Block 71 has four occupancies and a railroad right-of-way. The south half of Block 50 has four residences and three out-buildings, and the north half has four residences and five other structures. The north half of Block 51 has four residences, six other structures and a 60 to 80 foot right-of-way; and the south half has a 60-foot right-of-way, a car-

penter shop, a very large ice plant, a residence and two other structures. The North half of Block 70 has two residences, and the south half has three residences and two other structures. In the north half of Block 83 there is one residence and one barn. In the north half of Block 82 there are two residences and in the south half two residences. In Block 102, lying south of Block 83 there are four houses, and but one piece of vacant property. In Block 115, south of Block 102, there are four houses. In Block 103, south of Block 82, there are three houses. In Block 103, south of Block 82, there are three houses, and in Block 114 there are three houses. In Block 72 there are two residences and two barns; and in Block 49 there are eight residences with out-buildings.

(n) That at Fifth and Oak Streets there is a drop of seven or eight feet to a lower level, which cuts a line diagonally northwest and southeast across Blocks 48, 72 and 82, which lower level extends westerly and southwesterly a distance of 150 or 200 feet, is platted, and is suitable for building purposes, except that the streets need to be cut through.

(o) That within a radius of 100 feet from the center of the Sinclair tanks there is one residence, six storage tanks with a capacity of approximately 75,000 gallons, three warehouses, large coal-shed, and three out-buildings. Within a radius of 200 feet there are five residences, the same six storage tanks and warehouses, seven out-buildings, barns, etc., and a 130 foot frame coal-shed. Within a radius of 400 feet there are seventeen residences, the same storage tanks, warehouses and coal-sheds, a large ice plant, and 11 barns, out-buildings and other structures; and within a radius of 500 feet there are 21 residences, the same tanks, warehouses, coalsheds, ice plant, and a carpenter shop, and 20 barns, garages, out-buildings, and other structures.

LXII

(a) That the tanks of the Standard Oil Company are located in the southeast corner of the south half of Block 40; south of said tanks and a distance of ten feet is a frame [fol. 50] warehouse of the Standard Company where lubricating oils, greases and petroleum products are stored, and

to which pipes run from said tanks through which gasoline and kerosene are pumped into tank wagons which are loaded under a lean-to on the south side of said warehouse; that the gasoline pumps for this purpose are located in a small lean-to on the north side of the warehouse next to the tanks. North of said tanks, a distance of 27 feet, is a frame railroad tool-house 14 x 22 feet. West of the tanks and on the west side of the spur track are frame coal bins 105 feet long and 12 feet wide, constructed of dry lumber, in which large quantities of coal are stored, which sheds are 26-27 feet from the Standard tanks. West of said coal-sheds is a frame residence 93 feet distant from the Standard tanks, and immediately west of that residence is a frame garage. In the southwest corner is a two-story frame residence facing on Sixth Street, this being one of the best homes in the city. There are also three other out-buildings on the south half of Block 40 in the nature of barns, garages, etc.

(b) In the north half of Block 40, in a northwesterly direction from the Standard tanks, a hotel property occupies all said north half, except the extreme west and that extreme east which is taken up by the railroad right-of-way. The hotel is a two and one-half story structure 40 x 80 feet, and is 145 feet from the Standard tanks. Southwest of the hotel and adjacent to the alley, running through the center of Block 40, is a large combined garage and barn. On the northwest corner there is a residence 32 x 36 facing west on Sixth Street, in the rear of which, adjacent to the alley running through the center of Block 40, is a combined office and garage building. This home took first prize for beautiful homes in a contest in the City of Marysville.

(c) The tanks of the Standard Company are a little less than two blocks south of Broadway, which is the main business street in the City of Marysville, and approximately 300 feet south of the edge of the fire limits on the north side of Elm Street.

(d) The south half of Block 21, lying immediately north of Block 40, is almost entirely used by the city for storing machinery, material and tools, but in the southwest corner there is a residence with a barn and two out-buildings. The north half of Block 21 faces on Broadway Street, and is occupied by business property in the nature of a shoe store,

[fol. 51] barber shop, a large clothing store and the city hall, a cafe and a city store-house.

(e) Block 22, lying northeast of Block 40, is almost entirely business property. The north half fronts on Broadway and is solidly constructed. The south half contains a studio, a hotel, a large service garage, two small garages, a residence and a new building under construction which is 305 feet from the Standard tanks.

(f) The north half of Block 39, which lies directly east of Block 40, has three residences, a large furniture store, and five garages and out-buildings, together with a railroad right-of-way occupying a portion of two lots. The south half of Block 39 has a hotel with garage, a residence 208 feet from the Standard tanks, a cement-block works west of said residence, and a railroad right-of-way occupying about one-third of said south half.

(f) In the north half of Block 52, lying southeast of Block 40, there are two residences, 100 feet railroad right-of-way, and in the northwest corner adjacent to Seventh Street is a two-story hotel 65 x 40 feet, 160 feet distant from said tanks.

(h) The nature of the construction in Block 51 is described hereinabove, except that a residence in the northeast corner is 92 feet and 2 inches distant from the Standard property, and immediately west of said residence there is a new house under construction.

(i) In the north half of Block 50, lying southwest of Block 40, there are four residences, three facing north on Walnut Street and one east on Sixth Street, and five barns and garages and other out-buildings; and in the south half of Block 50 there are four residences facing south on Spring Street, and two facing east on Sixth Street, and one barn, one garage and one other out-building.

(j) In the south half of Block 41, lying immediately west of Block 40, there are three residences facing south on Walnut Street, and four out-buildings in the nature of barns, garages, etc., and in the north half of Block 41 there are five residences, four facing north on Elm Street and one west on Fifth Street, together with two garages or out-buildings.

(k) In the south half of Block 20, lying northwest of Block 40, there are five residences facing south on Elm Street, the nearest of which is 435 feet from the Standard tanks, and one barn and two other out-buildings; and the [fol. 52] north half of Block 20, facing on Broadway, is practically solid business building construction.

(l) In the south half of Block 40 on six lots there are two residences with out-buildings, the Standard Oil Company property, coal-bins 105 feet in length, railroad tool-house, four other structures and a railroad right-of-way; in the north half of Block 40 there is a large hotel, a residence, a doctors' office building and a large garage and barn.

(m) Block 39 has four residences, a hotel, a furniture store and a cement block works, six out-buildings and a 100 foot railroad right-of-way.

(n) The north half of Block 51 has only a vacant strip 40 x 30 feet.

(o) Block 50 has eight residences and eight barns, garages, etc.

(p) Block 41 has eight residences and six garages, barns, etc.

(q) The south half of Block 20 has five residences and three barns, garages, etc.

(r) That within a radius of 100 feet from the center of the Standard Oil Company's tanks there are one residence, a warehouse, frame tool-house and the large coal-bins. Within 200 feet there are four residences, two hotels, one warehouse, one tool-house, a cement-block works, the large coal-bins, and six out-buildings. Within a radius of 400 feet there are nineteen residences, three hotels, warehouse, tool-house, large ice plant, cement-block factory, three business buildings and twenty barns, garages and other out-buildings. Within a radius of 500 feet there is practically all the property heretofore described as in Blocks 40, 21, 22, 39, 52, 51, 50 and 40.

LXIII

That there are no changed conditions in the buildings or improvements around said tanks, or in their vicinity, which

would warrant or justify the requirements of Ordinance No. 350, that said tanks should be buried.

LXIV

That there are numerous tanks in the City of Marysville, Kansas, which are, under the provisions of said Ordinance No. 350, maintained in close proximity to residences and business buildings, which contain from 100 to 500 gallons of [fol. 53] distillate and fuel oil, and that said tanks are, under the authority of said ordinance, maintained above ground.

LXV

That under the provisions of said Ordinance No. 350 any quantity of crude oil less than 500 gallons may be stored in tanks above ground in any part of the City of Marysville, and that crude oil is, as far as fires and explosions are concerned, as hazardous, or more hazardous, than gasoline.

LXVI

That under the provisions of Section 1 of Ordinance No. 237, still in force, and by reference adopted by Ordinance No. 350, nor more than five gallons of gasoline, fuel oil or motor spirits can be stored or kept above ground in any building or upon any premises within the City of Marysville, in one container, and not to exceed two containers can be kept on such premises; while under the provisions of Section 3 of Ordinance No. 350 the amount of gasoline, kerosene or naphtha which can be stored or kept above ground must be less than ten gallons.

LXVII

That under the provisions of Ordinances Nos. 237 and 350, it is unlawful for any citizen of the City of Marysville to keep more than five gallons of gasoline in the tank of his automobile, and every garage-keeper in Marysville who stores cars the tanks of which contain gasoline is guilty of an offense under both of said ordinances and subject to the penalties thereunder.

LXVIII

That the provisions of Ordinances Nos. 237 and 350 permit and authorize a discrimination particularly in favor of those who desire to keep and store crude oil, distillate and fuel oil in quantities of less than 500 gallons above ground, and against those who wish to keep and store crude oil, distillate and fuel oil in quantities of 501 gallons or more above ground, and against those who wish to store and keep more than five gallons of gasoline, fuel oil or motor spirits on their premises in one container above ground, and against those who wish to keep and store ten gallons or more of gasoline, kerosene or naphtha above ground in the City of Marysville.

LXIX

That up until July, 1918, the population of the City of Marysville was approximately 2,000, at which time the [fol. 54] shops and general offices of the St. Joseph & Grand Island Railway Company were removed to Marysville from St. Joseph, Missouri, and at the same time Marysville was made a division point by the Union Pacific Railroad Company, and that thereafter the City of Marysville increased very materially in population until now it is over 4200, and since then there has been and is now a shortage of residences, and building activities both in residence and business property have been considerable.

LXX

That during the summer of 1923 an extension of the sanitary sewer system of the City of Marysville was made connecting with the sanitary sewer at the intersection of Fifth Street, with the alley between Spring and Walnut Streets, and extending south on Fifth Street one block, thence extending west along the alley through the center of Blocks 71 and 70 with a lateral running south on Sixth Street beyond Oak Street. An extension was also made from Fifth Street east along the alley from the center of Blocks 50 and 51, and about one-fourth of the way along the alley into Block 52. During the summer of 1923 and since that time there has been constructed a brick paving

on Sixth Street from Elm Street south to Jackson Street, and on Elm Street from Sixth Street east to the city limits at Sixteenth Street. Numerous other sidewalks have been constructed and graded in the vicinity of Block 71 and Block 40.

LXXI

That prior to 1918 Block 49 was a ball park, and it now contains eight residences and a number of out-buildings. Some of the residences in the proximity of Block 40 have been built in recent years, there being one in 1920, and one remodeled, both in the south half of Block 40. There is also a new house under construction in the north half of Block 51, and two of the houses in Block 50 have been built recently. The Riepen house in Block 71 has been remodeled, and it is reasonable to conclude that with the extension of the paving on Sixth Street and the construction of the sanitary sewers built recently more residences will be built in the immediate vicinity of Block 71. That a great many of the building sites and locations that are now unoccupied by residences are in the southwestern part of Marysville, and, generally speaking, all of the territory immediately north and northeast of Block 71 for a distance of many blocks is built up with residences and there is not much property vacant for building sites in that direction.

[fol. 55]

LXXII

That the tanks of the Standard Oil Company are two in number, each horizontal, 10′ in diameter and 16′ in length, constructed of steel plates 3/16″ thick and riveted together so as to form a cylindrical tank, each of a capacity of 11,000 gallons, resting on concrete piers 18″ high and extending 48″ into the earth. Each tank is equipped with a 2″ MacDonald Duplex Vent and an 18¾″ manhole vent, both on top of the tank, a lightning arrester or a grounding device of copper wire. These safety devices are of the best and most efficient type. The purpose of the venting device is to allow automatically the escape of vapor or gas arising from the contents of the tank and are so constructed that with increased pressure of vapor or gas from within the tank the vent is intended to enlarge and allow the escape

of accumulated gas and prevent any injury or danger from gas pressure. At the bottom of these tanks are pipe connections with valve cut-offs used for the filling of the tanks from tank cars on the railroad switch and through which to draw gasoline or kerosene as needed for distribution.

LXXIII

That the tanks of the Sinclair Refining Company are two in number, each vertical, 10′ 6″ in diameter and 18′ 7″ in height, constructed of steel plates 3/16″ in thickness, riveted together so as to form a cylindrical tank, and each of a capacity of approximately 12,000 gallons, resting on solid concrete foundation. Each tank is equipped with a 2″ MacDonald Duplex Vent and an 18″ manhole vent which is a cap or cover fitted loosely over the manhole. The purpose of these vents is to allow automatically the escape of vapor or gas arising from the contents of the tanks and they are so constructed that with increased pressure of gas from within the tanks the vent is enlarged and intended to allow the escape of accumulated gas and prevent any injury or damage from gas pressure. At the bottom of the tanks the pipe connections with valve cut-offs used for the filling of the tanks from tank-cars on the railroad switch and through which to draw gasoline or kerosene as needed for distribution. The said venting devices are approved and among the best safety devices and equipment known in the industry.

LXXIV

That there has never been any fire, accident, or explosion of any kind at or in the tanks or place of business of [fol. 56] either the Standard Oil Company or the Sinclair Refining Company or at any similar tanks in said City of Marysville.

LXXV

That under the provisions of said ordinance No. 350, gasoline, kerosene or naphtha in the amount of ten gallons, which must be in two containers of five gallons each, may be kept or stored in any building or premises, but all quan-

tities of gasoline, kerosene or naphtha in excess of ten gallons must be stored in tanks, barrels, or other containers, buried at least three feet underground. And that under said ordinance No. 350, five hundred gallons or less of crude oil, distillate or fuel oil, but only one such container on a premises may be kept or stored above ground; but all quantities of crude oil, distillate or fuel oil in excess of 500 gallons must be kept or stored in tanks, barrels or other containers, buried at least three feet under ground; and that under the provisions of said ordinance it is unlawful to store more than ten gallons of gasoline or kerosene above ground, and more than 500 gallons of crude oil, distillate or fuel oil above ground.

LXXVI

That both the Standard Oil Company and the Sinclair Refining Company are now, and have been since November 10, 1923, storing gasoline and kerosene in the City of Marysville in violation of said ordinance No. 350.

LXXVII

That said ordinance No. 350 does not pretend to regulate the transportation or use of gasoline and kerosene, but regulates only the keeping and storing of said products.

LXXVIII

That neither the Standard Oil Company nor the Sinclair Refining Company operates any automobiles in the City of Marysville for any purpose other than the transportation of petroleum products, nor does either of them own, operate or maintain a garage or garages in said City of Marysville.

LXXIX

That both the Standard Oil Company and the Sinclair Refining Company store gasoline and kerosene in their tanks located in the City of Marysville, and do not now, or never have, stored crude oil in said tanks, nor is crude oil stored by anyone in said City of Marysville.

[fol. 57]

LXXX

That the defendant, the City of Marysville, has caused the arrest of an agent of each of the plaintiff companies for the keeping and storing of gasoline and kerosene in said tanks as aforesaid in alleged violation of said ordinance No. 350.

LXXXI

Gasoline and kerosene are highly inflammable and combustible liquids and are dangerous and hazardous. Both vaporize when coming in contact with the atmosphere and will ignite when it comes in contact with flame or spark, and that vapor, mixed in proper proportions with the atmosphere, coming in contact with spark or flame will explode with most disastrous results. Gasoline is highly volatile and will flash at ordinary room temperature. Gasoline and kerosene can be handled so as to avoid fire and explosion, and it is generally true that where gasoline and kerosene are contained in tanks such as those used by plaintiffs, and equipped in the manner in which they are equipped, they will burn only at the vent openings in the tanks and will not explode when heat is applied to them. And yet, gasoline and kerosene are of such a character that even when the most modern safety devices are in use a relaxing of conditions, a careless act or an accident, or failure in the operation of the safety devices, or the presence of extreme heat, may result in fires or explosions most destructive to life and property.

The record shows fires at five storage stations in Kansas; two in 1919, two in 1922, and one in December, 1923. The McCracken and Greenleaf fires were at tanks of the Sinclair Company, equipped with McDonald Duplex Vents and loose manhole covers, the same or similar to those of the Company at Marysville, and at McCracken the top of the vertical gasoline tank was blown out and the kerosene tank exploded and was lifted off the foundation and thrown to the ground fifteen feet therefrom.

At Hays, Kansas, in November, 1919, tanks of the Standard Oil Company containing gasoline and kerosene burned and exploded. One end of the gasoline tank was blown out and against an elevator 82 feet away, which it burned com-

pletely, whereas the main part of the tank was hurled in the opposite direction a distance of 475 feet, breaking off an eight-inch spruce tree en route and lodging against and burning up a dwelling house where it struck, and in the [fol. 58] course of its travel killing nine people, wounding at least twenty-six more and burning several other houses.

Fires at storage stations have occurred which so heated up the contents in the storage tanks as to burst open the seams thereof and let gasoline run out and along the ground, burning in a flowing flame as it ran, igniting other property 30 to 60 feet away; and at other fires the flames have been known to shoot up into the air 50 to 100 feet high and be swept by the wind and set fire to and burn up property 60 to 75 feet distant therefrom.

That the danger of fire to warehouses adjacent to storage tanks is great owing to the fact that there are kept and stored therein oils, greases and petroleum products which are highly combustible, easily ignited and difficult to extinguish, and many instances have occurred where warehouses and storage tanks have become ignited by back-fires from automobile trucks, sparks from the gasoline engines used to pump the products to and from the storage tanks, sparks from static electricity created by the abrasion of metallic bodies, or otherwise, in which cases tank wagons and smaller barrels and containers of petroleum products in the warehouses have exploded. Such fires produce extreme heat around the storage tanks, have broken the connections, or melted off the valves, thus permitting the gasoline to flow out of the tanks and burn, adding to the fire and intensity of the heat, and in those cases should a safety device fail to operate or should more gas pressure be formed than the venting devices could relieve, an explosion would occur.

LXXXII

That distillate and fuel oil are not nearly so dangerous as gasoline and kerosene.

LXXXIII

That the objections which the plaintiffs make to the storing of gasoline and kerosene in tanks buried underground

are that the maintenance of said tanks is very difficult; should leaks occur they could not be discovered and the contents might penetrate through the earth, get into sewers, wells and basements, and contaminate water and cause explosions; and that such leaks would develop through the effect of electrolysis and corrosion, eating out the metal of the tank, vibration and temperatures changing lossen the seams, and by the tanks being "floated out" and breaking connections. With reference to the above objections the evidence shows.

[fol. 59] (a) That the conditions which produce electrolysis are not present in the City of Marysville, nor in Blocks 40 and 71, where the tanks of the plaintiffs are located.

(b) That the conditions which produce corrosion of metal underground are the acids in the soil combining with the oxygen in moisture, and sulphuric acid is a dangerous corrosive; and considering all the acid in the soil at the property of the Standard Oil Company in Block 40 as sulphuric acid, it tests .049 to .07 per cent. acid, and that the property of the Sinclair Company in Block 71 tests .025 per cent. acid. Although there is more chance of corrosion of metal underground of the Standard Oil Company property, it might take a term of years for it to occur.

(c) That under the conditions existing in and around Blocks 71 and 40 in the City of Marysville there would be vibration that might weaken the seams in tanks buried under ground.

(d) That the evidence shows that the seams of a tank under ground might be weakened by temperature changes to such an extent as to cause the tank to leak. Such tanks are, however, subject to less changes in temperature than tanks above ground.

(e) That tanks buried under three feet of ground in Block 71 have not floated out during periods of rather heavy rainfall, and any danger of floating can be overcome by proper drainage of the surface water by mounding up the earth, and by weighting, strapping or anchoring down the tanks.

(f) That tanks buried in compliance with Ordinance No. 350 would rest on a level thirteen feet below the level of the ground; that the only sewers in and around Blocks 71 and 40 are ten and one-half feet below the level of the ground, and the evidence does not show that there are any wells anywhere in the vicinity. The soil in Blocks 71 and 40 is a heavy black gumbo, shading gradually into a compact plastic yellow clay, and tests made thereof by attempting to force water through the same by exerting a pressure of fourteen pounds per square inch for two and one-half hours, showed that only a few small drops of water came through, and the same test with gasoline, no gasoline came through.

LXXXIV

That the danger from fire or explosion due to lightning, which causes a great many fires in oil storage, is less in underground tanks than in above ground tanks.

[fol. 60]

LXXXV

That the danger from fire or explosions due to static electricity is less in underground tanks than in above-ground tanks.

LXXXVI

That the base rate of insurance on storage tanks of gasoline and kerosene underground is fifty per cent. of the base rate of tanks above ground.

LXXXVII

That the provisions of Ordinances Nos. 237 and 350 are arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of the plaintiff, The Sinclair Refining Company, herein.

Conclusions of Law

I

That the United States District Court, for the District of Kansas, First Division, has jurisdiction of the parties to this action and of the subject-matter thereof.

II

That sections numbered one and three of said Ordinance No. 350 of the defendant, the City of Marysville, Kansas, and each and every provision thereof, is arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of plaintiff, and void.

III

That Ordinance No. 350 of the defendant, the City of Marysville, is arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of plaintiffs, and void.

Recommendations of Special Master

The Special Master recommends that a decree be entered in said cause in accordance with the foregoing Findings of Fact and Conclusions of Law, declaring and decreeing said Ordinance No. 350 of the City of Marysville, Kansas, to be arbitrary, unreasonable, discriminatory and confiscatory of plaintiffs' property, in violation of plaintiffs' rights under the Constitution and laws of the United States and the common law, the Constitution and laws of the State of Kansas, and void; that said defendants and each of them be perpetually enjoined and restrained from enforcing or attempting to enforce said ordinance, and that said plaintiffs have and recover from said defendants their costs in said suit.

[fol. 61] The Special Master further reports that the respective parties presented their several requests for findings of fact and conclusions of law.

Such requests are herewith returned as part of the record. Those not included in the foregoing findings of fact and conclusions of law reached by the Special Master are denied.

The case was fully presented by respective counsel, both in oral arguments and voluminous citations of authorities. Much time has been consumed in the taking of testimony, in considering the authorities cited, as well as in the preparation of the final report, copies of which were served upon respective counsel in the case.

Standard Oil Company deposited with the Special Master during the hearing the sum of $442.33. Sinclair Refining Company deposited the same amount. The defendant, the City of Marysville deposited $393.86, making a total of $1,278.52. For such advancement each should receive credit in the taxation of costs.

The Special Master has expended for costs of reporting the evidence taken and proceedings had and costs of transcript of same the sum of $840.71, which he asks may be allowed and taxed as costs in the case, vouchers for same being returned herewith.

The Special Master has expended for stenographic fees in the preparation of his report and in making copies of same for counsel in the case the sum of $44.00, which he asks may be allowed and taxed as costs in the case.

The Special Master has expended for hotel and incidental expenses in the hearing of said causes the sum of $145.00, which he asks may be allowed and taxed as costs in the case.

The Special Master charges himself with $248.80, balance of unused deposit.

Standard Oil Company has paid its witnesses' per diem, attendance and mileage, amounting to $188.80, a statement of which is herewith returned and made a part of this report.

Sinclair Refining Company has paid out for its witnesses for per diem, attendance and mileage $111.20, statement of which is herewith returned and made a part of this report.

The City of Marysville has paid out for its witnesses for per diem, attendance and mileage the sum of $486.25, state-
[fol. 62] ment of which is herewith returned and made a part of this report.

For which amounts, so paid out by the respective parties, each should have credit in the taxation of costs.

The small model of a McDonald Duplex Oil Tank Valve, being plaintiffs' Exhibit No. 8, and the piece of iron pipe, being defendants' Exhibit No. 9, were left in the Federal Court room at Kansas City, Kansas, for future use.

All of which is respectfully submitted this 24th day of January, A. D., 1925.

Charles Blood Smith, Special Master.

In United States District Court

Defendant's Exceptions to the Report and Findings of the Special Master—Filed Feb. 13, 1925

Now come the above named defendants and except to the report and findings of Charles Blood Smith, Esq., Special Master, filed in this cause on the 24th day of January, 1925, and for cause of exceptions show:

I

For that the said Special Master erred in finding (Nos. IX and X) that the plaintiff, the Standard Oil Company, erected a plant and tanks for keeping and storing gasoline and kerosene with the knowledge and consent of the defendant city, and that said plaintiff's right or authority to erect and maintain said tanks for said purpose was never denied or questioned until October 8, 1923, for the reason that said findings are contrary to and not supported by the record as shown by the stipulation entered in the record at Tr. 457; whereas the Special Master ought to have found, as set out in defendant's request No. 4, that the records of the City of Marysville do not show that said city ever granted the Standard Oil Company any permit to so locate or maintain said tanks, and that no action questioning the right or authority of said plaintiff to maintain, or the manner of maintaining said tanks, such as that contemplated in Ordinace No. 350, was ever taken by the defendant City until two years prior to its passage, to-wit: October 8, 1923, at which time ineffectual efforts were made to regulate by ordinance all keeping and storage of gasoline within said city (Tr. 457).

[fol. 63]

II

For that the said Special Master erred in finding (No. XIII) that the tanks of the plaintiff, the Standard Oil Company, at Marysville, each have capacity of approximately 17,000 gallons for the reason that said finding is contrary to and not supported by the evidence as shown by the plaintiff's witness, Mr. Wagner, at Tr. 32; and said finding is in conflict with the Special Master's finding No. LXXII

based on the defendant's request No. 16, and said finding No. XIII should be made to conform therewith.

III

For that the said Special Master erred in finding (No. XVI) that both of the venting devices with which each of the plaintiff's, the Standard Oil Company, tanks is equipped are sufficient to carry off any vapor arising from the liquid contents of the tanks, even when the same is subject to extreme heat, for the reason that said finding is a conclusion of fact in conflict with Special Master's finding No. LXXXI.

IV

For that the said Special Master erred in finding (No. XX) that no complaint was ever made of or fault found with the construction, equipment or the manner of operation of the plaintiff's, the Standard Oil Company, tanks, for the reason that said finding is not supported by any evidence in the record and is contrary to the stipulation entered at Tr. 457.

V

For that the Special Master erred in finding (No. XXI) that the construction, equipment and manner of operation of each of the plaintiff's, The Standard Oil Company, tanks are standard and of the kinds and character generally employed by said plaintiff in the conduct of its business at all points other than the city of Marysville, for the reason that said finding is based on incompetent, irrelevant and immaterial testimony which attempts to establish a custom not binding on these defendants and not within the issues of the cause, and constituting no equity grounds for equitable relief against the defendants, proper and timely objection to which was made at Tr. 38-9, 228-9.

VI

For that the said Special Master erred in finding (Nos. XXII, XXIII and XXIV) that the plaintiff, the Standard Oil Company, during the five years last past has had 66

[fol. 64] fires, and no more, at the 12,000 tanks similar to its tanks in Marysville, and of those the one at Hays, Kansas, November, 1919, is the only one in which a tank exploded, or in which fire spread to or injured other property or persons, for the reason that said findings are based on incompetent, and irrelevant, and immaterial testimony not within the issues of the cause, and constituting no ground for equitable relief, proper and timely objection to which was made at Tr. 616.

VII

For that the said Special Master erred in finding (No. XXV) that the plaintiff's tank, which exploded during the fire at Hays, Kansas, was not equipped with a manhole vent similar to the manhole vent with which each of the tanks of the plaintiff at Marysville, Kansas, is equipped, for the reason that said finding is not a fair and complete statement of the facts, and is misleading, as is shown by the evidence of the witnesses Love (Tr. 402, 4-5), King (Tr. 428) and Sims (Tr. 558).

VIII

For that the said Special Master erred in finding (No. XXVI) that there is no evidence in this case tending to show that any tank similar in construction, equipment and manner of operation to those maintained by said plaintiff at Marysville, Kansas, ever exploded, or that fire from any such tank ever spread to or otherwise injured either the property or the safety of others, for the reason that said finding is in conflict with Special Master's finding No. LXXXI, and is not a fair and complete statement of the facts, and is misleading, as is shown by the evidence of witnesses Hubbard (Tr. 338), Decker (Tr. 346, 7 and 8, and 355), Quinley (Tr. 359 and 60), Frankenstein (Tr. 362, 3 and 4, 368 and 370), Keuffer (Tr. 372-3, 375, 378 and Exhibit "I"), Smith (Tr. 383-6), Love (4024-5-7 and 412), King (Tr. 425-9), Armstrong (Tr. 458-9 and 60-1), Defendant's Exhibit "F" and 1, 2, 3, 4 and 5. Cross 63, Gamber, 179, Hopkins 156.

IX

For that the Special Master erred in finding (Nos. XXVIII, XLV and LX) that the burying of the tanks of either of the plaintiffs is more dangerous to property and persons than the maintenance and operation of said tanks above ground, for the reason that said finding is a mere conclusion of fact which invades and usurps the judgment and discretion of the Mayor and Council of the City of Marysville, and is in conflict with the Special Master's [fol. 65] findings Nos. LXI, LXII, LXIX, LXX, LXXI, LXXXI, LXXXIII, LXXXIV, LXXXV and LXXXVI, and having given this finding further erred in declining to find, as set out in the defendant's request No. 39, that there is a substantial conflict of opinion as to whether storage above ground or under ground is more hazardous to public safety, and that all testimony to the effect that above ground storage is less hazardous is based on general conditions and not on conditions existing at and around blocks 40 and 71 in the city of Marysville, whereas the testimony that underground storage is less hazardous is based both on general conditions and conditions in and around blocks 40 and 71 in the City of Marysville, and that there is a fair difference of opinion as to whether storage of gasoline and kerosene above ground or under ground is more hazardous to the public safety, all as shown by the testimony of the witnesses Cross (Tr. 51, 2, 4 and 57), Boehmer (Tr. 92, 169), Hopkins (Tr. 141), Gamber (Tr. 174), Lewis (Tr. 229), Campbell (Tr. 196), Cady (Tr. 535-6), Simpson (Tr. 576, 7, 8, and 9, 585, 6, and 7), Henderson (Tr. 620), Burgster, (Tr. 630), Patrick (Tr. 647, 8 and 9), and findings Nos. LXXXI, LXXXIII, LXXXIV, LXXXV.

X

For that the said Special Master erred in finding No. XXIX) that the plaintiff's, the Standard Oil Company, tanks are located in a sparsely populated portion of the City of Marysville, for the reason that said finding is in conflict with Special Master's finding- Nos. LXII, LXIX, LXX and LXXI.

XI

For that the said Special Master erred in finding (Nos. XXX and LXIII) that there are no changed conditions in the buildings or improvements around the tanks and premises of either of said plaintiffs, or in that vicinity, which would warrant or justify that said tanks be buried as required by Ordinance No. 350, for the reason that said findings are in conflict with the Special Master's findings Nos. LXI, LXII, LXIX, LXX and LXXI.

XII

For that the said Special Master erred in finding (No. XXXI) that each of the tanks of the plaintiff, the Standard Oil Company, are so operated and maintained and equipped with venting devices as to be safe from the standpoint of [fol. 66] the public safety, for the reason that said finding is a mere conclusion of fact and in conflict with the Special Master's finding No. LXXXI, and the further finding that said tanks do not present a greater fire hazard than would a frame building or a stock of groceries in a frame building at the same location, for the reason that said finding is based on incompetent, irrelevenat and immaterial testimony not tending to prove any issues in the cause, and constituting no equity, proper and timely objection to which was made at Tr. 178, 198, 201; and is argumentative, and,

Having given said finding No. XXXI, the said Special Master erred in declining to give defendant's request No. 17B, that the city council may make reasonable classifications of private property and business for the purpose of regulating them in the interest of public safety, and the classification putting frame buildings and frame business structures in one class, and storage of gasoline and kerosene and petroleum products in another, is a proper classification, and that the evidence does not show, and therefore, there is no presumption, that proper regulations have not been made of frame buildings and business structures in the interest of public safety.

XIII

For that the said Special Master erred in finding (No. XXXII) that the dwelling house closest to the plaintiff's

the Standard Oil Company, tanks, is more than 98 feet distant, for the reason that said finding is contrary to and not supported by the evidence, as is shown by the testimony of the witness Bowman (Tr. 272) and finding No. LXII, and for the further reason that said finding is not a fair and complete statement of the facts and is misleading, as is shown by finding of the Special Master No. LXII.

XIV

For that the said Special Master erred in finding (No. XXXV) that large quantities of cinders have been and are now used for ballast upon the tracks of the Union Pacific Railway Company, which is 20 feet from the plaintiff's, the Standard Oil Company, station, for the reason that said finding is not a clear, accurate and complete statement of the facts, as is shown by the testimony of the witnesses Brooks (Tr. 80), Bowman (Tr. 438), and in declining to find, as set out in defendant's request No. 32, that the ballast on the spur track in block 40 is of cinder and Sherman Hill gravel, and that although water passing over cinders produces a corrosive acid, yet pipes buried on this [fol. 67] right-of-way for at least 11 years show that there is little danger of corrosion to a tank buried on the property of the Standard Oil Company but what can be protected against (Tarvin 464-9 and Defendant's Exhibit 9).

XV

For that the said Special Master erred in finding (No. XXXVII) that the natural flow and drainage is from the railroad tracks of the Union Pacific Railway Company upon and over the property occupied by the plaintiff, the Standard Oil Company, for the reason that there is no testimony in the record to support said finding.

XVI

For that the said Special Master erred in finding (Nos. XL and LXV) that crude oil is more dangerous from the standpoint of public safety than is gasoline or kerosene, and presents a greater hazard, for the reason that said finding is mere surplusage and not within the issues as shown by Special Master's finding No. LXXIX, and is so

general in its nature as to be clearly erroneous, as shown by the testimony of the witnesses Cross (Tr. 54, 5 and 6), Cady (Tr. 530, 3, 4, and 5, 550-1), Simpson (Tr. 574), Patrick (Tr. 649), Boehmer (Tr. 95 and 6, 483, 692), Hopkins (Tr. 144, 145).

XVII

For that the said Special Master erred in finding (Nos. XLI and LXVI) that under Ordinance 237 not more than five gallons of gasoline, fuel oil or motor spirits can be stored or kept above ground in any building or upon any premises in any one container, and not to exceed two containers to a premise, whereas under Ordinance No. 350, the quantity of said commodities which can be stored or kept is less than ten gallons, for the reason that said finding does not prove or tend to prove any of the issues in this cause, and if there be any conflict, the provisions of Ordinance No. 350 will govern.

XVIII

For that the said Special Master erred in finding (Nos. XLII and LXVII) that under the provisions of Ordinance No. 237 and No. 350 it is unlawful for any citizen of Marysville to keep more than five gallons of gasoline in the tank of his automobile, and that every garage-keeper in Marysville, who stores cars the tanks of which contain gasoline, is guilty of an offense under the ordinance, for the reason that said finding is an erroneous interpretation of said ordi-
[fol. 68] nance, and does not prove or tend to prove any of the issues in this cause, as is shown by the Special Master's findings Nos. LXXVII and LXXVIII, and for the further reason that said finding is also based on incompetent, irrelevant and immaterial testimony not tending to prove any of the issues in the cause, and constituting no equity or ground for equitable relief, proper and timely objection to which was made at Tr. 28, 134, 136.

XIX

For that the said Special Master erred in finding (No. XLIII) that the provisions of Ordinances Nos. 237 and 350 permit and authorize a discrimination in favor of those

who keep and store crude oil, distillate, and fuel oil in quantities of less than five hundred gallons above ground and against those who wish to keep and store the same commodities in quantities of five hundred gallons or more above ground; and against those who wish to store and keep ten gallons of gasoline, fuel oil, or motor spirits on their premises in one container above ground; and against those who wish to keep and store ten gallons or more of gasoline, kerosene, or naphtha above ground in the City of Marysville, for the reason that said finding is an erroneous interpretation of said ordinances and not within the issues in this cause; Whereas, the Special Master ought to have granted the finding as set out in defendant's Request No. 43, that Ordinance No. 350 makes a reasonable classification as between gasoline and kerosene on the one hand, and fuel oil and distillate on the other; and a reasonable classification as between the keeping and storing of ten gallons or less of gasoline or kerosene on the one hand and quantities in excess of ten gallons on the other; and a reasonable classification as between the keeping and storing of five hundred gallons of fuel oil and distillate on the one hand and quantities in excess of five hundred gallons of said products on the other hand; and said ordinance applies equally to all persons, firms, or corporations who keep and store like amounts of gasoline and kerosene in the one case, and like amounts of distillate and fuel oil on the other and is not discriminatory and does not deny to either of the plaintiffs the equal protection of the law; all of which is shown by Special Master's findings No. LXXXI to LXXXVI, both inclusive, LXI, LXII, LXIX, and LXX, defendant's exhibits F, 1, 2, 3, 4, and 5, and the testimony of the witness, Cross, (Tr. 55-6).

XX

For that the said Special Master erred in finding (Nos. XLVII and LXXXVII), that Sections 1 and 3 of Ordinance [fol. 69] No. 350, and each and all parts thereof are arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of the plaintiff for the reason that said finding is a conclusion of fact based on erroneous findings of fact, is not supported by the evidence, is not a fair

and reasonable conclusion from the findings made by the Special Master herein, and constitutes an invasion and usurpation of the discretion of the Mayor of and City Council of the City of Marysville.

XXI

For that the said Specialy Master erred in finding (No. LIII) that each of the tanks of the plaintiff, The Sinclair Refining Company, is equipped with sufficient venting devices to care for all excess vapors even under conditions of extreme heat, and that said vents are maintained in good working order and condition and that the connections, pipes, cut-offs and equipment for filling and emptying said storage tanks and tank wagons are sufficient and safe equipment and that all of said equipment is maintained and operated in a first class, careful, prudent, and safe manner, and that the said plaintiff's storage tanks have been operated carefully, prudently, and safely; for the reason that said finding is not supported by any evidence and is contrary to the evidence as shown by the testimony of the witnesses, Travelute, (Tr. 243-5-6), Fenwick, (Tr. 330), and defendant's Exhibits A and B, and for the further reason that said finding is in conflict with Special Master's Finding No. LXXXI, and the testimony of the witness, Hubbard, (Tr. 338), Decker, (Tr. 345, 7 and 8, and 355), Quinley, (Tr. 359 and 60), Frankenstein, (Tr. 362, 3 and 4, 368 and 370), Keuffer (Tr. 372-3, 375, 378 and Exhibit "I"), Smith (Tr. 383-6), Love (402-4-5-7 and 412), King (Tr. 425-9), Armstrong, (Tr. 458-9 and 60-1).

XXII

For that the said Special Master erred in finding (No. LVI) that the tanks of The Sinclair Refining Company were constructed under authority duly granted by the mayor and councilmen of the City of Marysville for the reason that said finding is not a fair, accurate, and complete statement of the facts as shown by the petition of The Sinclair Refining Company filed herein; Whereas, the Special Master ought to have found, as set out in defendant's Request No. 6, that said tanks were constructed under authority granted to one J. H. Riepen, on September 12, 1910, as shown by plaintiff's Exhibit D.

[fol. 70]

XXIII

For that the said Special Master refused to give that part of defendants' Request No. 15 that "citizens have assigned as a reason for not building in the vicinity of Block 71 their fear of the danger of the explosion of oil tanks," which finding should have been given as is shown by the testimony of the witness, Travelute, (Tr. 255-6).

XXIV

For that the said Special Master erred in refusing to give that part of the defendant's Request No. 27, which states that "and there have been instances when tanks containing the same products and equipped in the same or similar manner have burned and, or exploded, causing death and serious destruction of property," which finding is supported by Special Master's finding No. LXXXI, and the testimony of the witnesses, Travelute, (Tr. 243-5-6), Fenwick, (Tr. 330), and defendant's Exhibits A and B, and for the further reason that said finding is in conflict with Special Master's finding No. LXXXI, and the testimony of the witnesses, Hubbard, (Tr. 338), Decker, (Tr. 345, 7 and 8 and 355), Quinley (Tr. 359 and 60), Frankenstein (Tr. 362, 3 and 4, 368 and 370), Keuffer (Tr. 372-3, 375, 378 and Exhibit "I"), Smith (Tr. 383-6), Love (402-4-5-7 and 412), King (Tr. 425-9), Armstrong, (Tr. 458-9 and 60-1).

XXV

For that the said Special Master erred in refusing to find (No. LXXXIII, (b)) with reference to the acids found in Blocks 40 and 71 in the City of Marysville, as set out in defendant's Request No. 30, b, that, "in each case it is very doubtful that the acid found is sulphuric acid," as shown by the testimony of the witness, Cady (Tr. 511-12), and further erred in finding that it might take a term of years for corrosion to occur under ground at the Standard Oil property; Whereas, the said Special Master ought to have found that it would take a term of years for corrosion to even start and that there would be no difficulty in protecting against it, as shown by the testimony of the witnesses, Cady, (Tr. 513-4-5-6-7), Patrick, (Tr. 646-7).

XXVI

For that the said Special Master erred in finding (No. LXXXIII (c)) that under the conditions in and around Blocks 71 and 40, in the City of Marysville "there would be [fol. 71] vibration that might weaken the seams in tanks buried under ground;" Whereas, the Special Master ought to have found, as requested in defendant's Request No. 30 (c), that "it is very doubtful whether under the conditions existing in and around Blocks 71 and 40, in the City of Marysville, there would be vibration sufficient to weaken the seams in tanks buried under ground and any leakages from such cause is a very remote possibility, as shown by the testimony of the witnesses, Brooks (Tr. 812, 890), Cady, (Tr. 521), Simpson, (Tr. 594).

XXVII

For that the said Special Master erred in finding (No. LXXXIII (d)) that "the evidence shows that the seams of a tank under ground might be weakened by temperature changes to such an extent as to cause the tank to lean"; Whereas, the Master ought to have found, as set out in defendant's Request No. 30 (d), that the probability that the seams of a tank under ground being weakened by temperature to such an extent as to cause leaks is very remote, as shown by the testimony of the witnesses, Boehmer (Tr. 104-5-6, and 484), Fenwick (Tr. 310), Cady, (Tr. 519-20), and Simpson (Tr. 575-6-7-8, and 603).

XXVIII

For that the said Special Master erred in refusing to find, (No. LXXXIII (f)) as a part of the finding that the tests made showing that a few drops of water and no gasoline came through samples of soil taken from Blocks 71 and 40, that said soil is so nearly impervious as to make it quite improbable that any leaks so small as not to be discovered would seep through the soil in a lateral direction, but rather would come up through the loose soil in which the tanks are buried and dissipate in the air and that owing to the fact that said tanks are lower than the sewer level and the nature of the construction of the sewers that the possibility

of any gasoline getting into the sewers is too remote to present any serious danger; as shown by the testimony of the witnesses, Cady (Tr. 507-10, 527-8), Brooks (Tr. 85-6), and Bowman (Tr. 286-7).

XXIX

For that the said Special Master erred in refusing to find as set out in defendant's Request No. 28 that the storage of gasoline in quantities of ten thousand gallons in a tank in a residential district is very hazardous, as shown by the testimony of witness, Cross (Tr. 62).

[fol. 72]

XXX

For that the said Special Master erred in refusing to find, as set out in defendant's request No. 33 "That there is no cinder ballast on the spur track in Block 40," as is shown by the testimony of the witness Bowman (Tr. 437-8).

XXXI

For that the said Special Master erred in refusing to find, as set out in defendant's Request No. 36, that a large percentage of fires at storage stations originate in or about warehouses caused by back-fires of the motors in the tank-wagons, sparks from gasoline, pumping engines, and other causes, resulting from fire, create extreme heat around storage tanks, and as the heat increases the amount of vapor from the contents of the tank increases, and as the vapor increases the greater the pressure becomes, and the greater the pressure the more danger there is of an explosion and that this danger from communicated fire is almost entirely eliminated in the tanks buried under ground on account of the protection of the covering of three feet of earth as shown by the testimony of the witness Boehmer (Tr. 100, 484-5, 439-4), Wagner (Tr. 166-7), Cady, (Tr. 535), Simpson (Tr. 575-6), Cross (Tr. 660-1-2), Tasker (Tr. 452-3-4), Defendant's Exhibit, "F," 1, 2, 3, 4, 5,) Hopkins (Tr. 155).

XXXII

For that the said Special Master erred in refusing to find, as set out in defendant's Request No. 37, that, owing to

the fact that there is more evaporation in above ground tanks than under ground tanks and owing to the breathing process of the tanks above ground due to temperature changes there is more danger of having an explosive mixture in the tanks, as shown by the testimony of the witnesses, Boehmer (Tr. 97-8, 100), Cady (Tr. 518-9, 520-1, 552), Simpson (Tr. 577-8-9, 580, 596), Patrick (Tr. 648).

XXXIII

For that the said Special Master erred in refusing to find, as set out in defendant's Request No. 38, that there is much less danger to the public safety from an explosion in a storage tank buried three feet under ground than having a similar tank above ground, as shown by the testimony of the witness Henderson (Tr. 621).

[fol. 73]

XXXIV

For that the said Special Master erred in refusing to find, as set out in defendant's Request No. 40, that the City Council of the City of Marysville, acted in good faith in passing Ordinance No. 350, believing that the regulation therein described was in the interest of the public safety, for the reason that that fact was conceded by counsel for the plaintiffs during the argument, and said finding is a fair conclusion from the presumption which attached to the act of the City Council in passing said Ordinance and the findings Nos. LXI, LXII, LXIX, LXX, LXXI, LXXVII, LXXVIII, LXXIX, LXXXI, LXXXII, LXXXIII, LXXXIV, LXXXV, LXXXVI made by the Special Master herein.

XXXV

For that the said Special Master erred in refusing to find, as set out in defendant's Request No. 42, that the City Council of the City of Marysville, had reasonable grounds for believing that the storage of gasoline and kerosene in tanks buried three feet under ground in blocks 71 and 40, in said City was not [—] conducive to the public safety, life and property, than the storage of said tanks above ground, for the reason that said finding is a fair conclusion from the findings made by the Special Master herein, as set out in exception No. 35.

XXXVI

For that the said Special Master erred in refusing to find, as set out in defendant's Request No. 44, that Ordinance No. 350, and each and all of its parts, constitutes a reasonable exercise of the police power of a city of the second class in Kansas, and is not arbitrary, capricious, and subversive of the rights of the plaintiff.

Exceptions to Conclusions of Law

Defendants except to the conclusions of law filed by Charles Blood Smith, Esq., Special Master, and for cause of exception show:

I

For that the said Special Master concludes that sections Nos. 1 and 3 of Ordinance No. 350 of the City of Marysville, Kansas, and each and every provision thereof, is arbitrary, capricious, discriminatory, unreasonable, and subversive of the rights of the plaintiff and void, for the reason that said conclusion is based on erroneous and incompetent findings of fact, is not a fair and reasonable [fol. 74] conclusion from the findings made by the Special Master but on the contrary is an invasion of the discretion of the mayor and city council of the defendant city, and is the substitution by the Special Master of his opinion for that of said mayor and city council, and interferes with the right and power reposed in said mayor and city council to protect the welfare of the citizens of said city, fairly and reasonably exercised.

II

For that the said Special Master errs in his conclusion that Ordinance No. 350 of the defendant, The City of Marysville, is arbitrary, capricious, discriminatory, unreasonable, and subversive of the rights of the plaintiff and void, for the reason that said conclusion is based on erroneous and incomplete findings of fact, is not a fair and reasonable conclusion from the findings made by the Special Master, but on the contrary is an invasion of the discretion of the mayor and city council of the defendant city, and is the sub-

stitution by the Special Master of his opinion for that of said mayor and city council, and interferes with the right and power reposed in said mayor and city council to protect the welfare of the citizens of said city, fairly and reasonably exercised.

Harry W. Colmery, Edgar C. Bennett, Frank H. McFarland, Attorneys for the Defendants.

In United States District Court

Plaintiffs' Exceptions to Special Master's Findings and Conclusions—Filed Feb. 13, 1925

Come now the Standard Oil Company and the Sinclair Refining Company by their respective attorneys, Earle W. Evans, and Thomas F. Doran, and jointly and severally except to all that part of Finding Number 81 of the Report of the Special Master filed herein following the first paragraph thereof, for the reasons and upon the grounds following, to-wit:

That the evidence upon which the portion of said finding herein excepted to is founded cover individual instances of fires which occurred at points other than the City of Marysville, was incompetent to prove or tend to prove or to disprove any issue in this consolidated case, in that said evi- [fol. 75] dence failed to show that the tanks, equipment, surroundings, conditions and manner of operation were the same or similar to those used in Marysville; and, on the contrary, the evidence affirmatively shows in the case of each fire that the equipment of the tanks at which such fires occurred and the surroundings, method, manner and circumstances under which they, and each of them, were operated were different from those in use in the City of Marysville. And for that reason the evidence thereon was wholly incompetent and was admitted and retained in the record over the repeated and earnest objections of the plaintiffs, the Standard Oil Company and the Sinclair Refining Company, and for the reason that to each ruling of the court admitting such evidence and refusing to strike out the same an exception was preserved by counsel for plaintiffs.

That the admission and retention of such evidence in the record was erroneous and prejudicial to the plaintiffs, and that no valid or binding finding can be founded upon such evidence so admitted over the objections and exceptions of the plaintiffs herein. And that portion of Finding Number 81 by the Master, herein excepted to, is for the reasons stated erroneous and has no binding effect upon the plaintiffs herein or either of them, and should be stricken from the report of the Special Master.

The Sinclair Refining Company, for itself, separately excepts to that portion of Finding Number 81 which reads as follows:

"The record shows fires at five storage stations in Kansas: two in 1919, two in 1920, and one in December, 1923. The McCracken and Greenleaf fires were at tanks of the Sinclair Company, equipped with McDonald Duplex Vents and loose manhole covers, the same or similar to those of the company at Marysville, and at McCracken the top of the vertical gasoline tank was blown out and the kerosene tank exploded and was lifted off the foundation and thrown to the ground fifteen feet therefrom."

This specific finding is erroneous, is contrary to the evidence, and is not sustained by any evidence found in the record in the following particulars, to-wit:

(a) That the fire at Greenleaf was not at a tank of the Sinclair Company, but was at a tank owned and operated by the Standard Oil Company. (See evidence of Henry Quinley, Rec. pp. 356-370, particularly p. 361.) There is no evi-[fol. 76] dence to show that there was an explosion in these tanks of the Standard Oil Company at Greenleaf.

(b) That said finding above quoted states that the fires at McCracken and Greenleaf were at tanks belonging to the Sinclair Refining Company, and that

"At McCracken the top of the vertical gasoline tanks was blown out and the kerosene tank exploded and was lifted off the ground and thrown fifteen feet therefrom."

This finding is erroneous, is not sustained by any evidence and is contrary to the evidence, in that there was no explosion in the tanks of the Sinclair Refining Company in

the fire at McCracken, the top of its vertical tank was not blown off, and its kerosene tank did not explode and was not lifted from the foundation or thrown to the ground fifteen feet therefrom.

The witness Harry Frankentsein testified, page 364, speaking of the Sinclair Refining Company tanks at McCracken:

"A. Yes, it blowed the man-hole (cover) off and the gas shot th-ough the top of the tanks and burned inside, but didn't blow the tanks up."

On the same and the following page he says that the explosions referred to occurred in the Kansas and Texas Oil Company tanks, and not in the Sinclair Refining Company tanks, and that the tanks from which the tops and bottoms were blown off, and the tank thrown fifteen feet from its foundation, were tanks of the Kansas and Texas Oil Company.

The witness Herm Keuffer testified to the same thing. He said, Rec. page 373:

"Q. What happened to the K. T. tanks?

A. One exploded at the top, the lid at the top blew off, and the other raised up about eight feet from the ground and the bottom blew off."

Q. You mean the manhole on the first one?

A. No, the whole top.

Q. And the other?

A. Lifted about six feet and lit on its side."

Referring to the pictures of these tanks the same witness testified, page 374:

"A. • • • The blackened ones (referring to the picture) are at the Sinclair. They stood up and the K. T.'s fell down.

[fol. 77] And again:

"Q. Right here—Now this one here is the K. T.?

"A. Yes. The one fell over and the bottom came out.

There is no evidence in the record of an explosion of the Sinclair tanks at the McCracken fire, or at the top of or bot-

tom was blown out of either of the Sinclair tanks at that place at the time of the fire, or that any one of them was blown from its foundation. All of this testimony relates to the K. T. tanks. The record shows that the K. T. tanks were not equipped in the same manner or similar to those of the Sinclair company at Marysville.

Keuffer testified Rec. p. 376:

"Now did you make an examination after the fire as an official (the record shows that Keuffer was the fire marshal or chief) to determine the condition of these tanks and the vents and man-holes, and that sort of thing?

A. I did of the K. T.

Q. What sort of vents and man-holes did the K. T. have?

A. They had a man-hole sixteen inches in diameter, made of the same material as the tanks, and bolted down to the tank.

Q. What kind of cover?

A. That is the cover. And they have a four inch collar, welded down on the cover, and a plug screwed in, and in the other side of the man-hole is a two inch cover that is welded on the top, that is, it was threated when I saw it, but there was nothing there.

At page 377 the same witness testified:

"Q. Did you make any examination as to the Sinclair tanks?

A. No sir.

Q. As to man-holes or vents?

A. No sir."

The record shows no evidence whatever that the tanks in which the explosions did occur at McCracken had the same equipment, or were managed and operated in the same or a similar manner as those of the plaintiffs at Marysville; and, on the contrary, affirmatively shows that they were not equipped in the same or a similar manner.

It therefore follows that the portion of Finding Number 81 separately and specifically excepted to by the Sinclair Refining Company is not sustained by any evidence and is

[fol. 78] affirmatively shown to be erroneous, and for this reason it must be stricken out under these exceptions.

Respectfully submitted.

Standard Oil Company, by Earle W. Evans, Its Attorney. Sinclair Refining Company, by Thomas F. Doran, Its Attorney.

[File endorsement omitted.]

In United States District Court

Plaintiffs' Motion to Confirm Special Master's Report—Filed Feb. 13, 1925

Come now the plaintiffs, Standard Oil Company and the Sinclair Refining Company, by their respective attorneys, Earle W. Evans and Thomas F. Doran, and move the Court for the entry of an order herein, approving and confirming the report of the Special Master filed herein, as to Findings of Fact, Conclusions of Law, and Recommendations when modified under the exceptions filed herein by the plaintiffs.

Respectfully submitted.

Standard Oil Company, by Earle W. Evans, Its Attorney. Sinclair Refining Company, by Thomas F. Doran, Its Attorney.

In United States District Court

Order of Revivor, Ruling on Plaintiffs' Exceptions, and Order of Submission—Filed May 25, 1925

Now on this second day of May, A. D., 1925, the above entitled causes came regularly on to be heard before the Judge of the United States District Court for the District of Kansas, First Division, in Chambers at Kansas City, Kansas.

The plaintiff Standard Oil Company appearing by Earle W. Evans, the plaintiff Sinclair Refining Company appear-[fol. 79] ing by Thomas F. Doran, and the defendants in each case appearing by Edgar C. Bennett, City Attorney

of the City of Marysville, Kansas, and by John S. Dean and Harry W. Colmery of Dean & Colmery.

And the Court having heard the arguments and statements of respective counsel for plaintiff and defendants, upon the exceptions filed to the Report of the Special Master herein by the Standard Oil Company and the Sinclair Refining Company, jointly and severally, and the exceptions filed to said Report by the defendants herein, and the Court being fully advised in the premises, pursuant to agreement of all parties hereto, finds:

1. That it has been shown that since the trial of these causes, as the result of an election held in the City of Marysville, Kansas, the officials of said city, defendants in each of these causes, have been changed, and that these causes should be revived in the names of their successors, who are now, L. N. Cole, Mayor, successor to Charles F. Travelute, who was mayor of the City of Marysville at the time of the bringing of these actions; R. E. Long, G. F. Bauman, Ed Hall, J. H. Reynolds, Oscar Terry, W. E. Miller, E. G. Filbert and E. C. Webber, successors to the councilmen in office at the date of the filing of the petitions herein, to-wit: Leonard Cole, E. G. Filbert, Ed Hall, Paul Kirkpatrick, Oscar Terry, T. J. Austin, and Harry Thompson; Edgar C. Bennett, City Attorney, and P. Hays, Marshal of said city, who by appointment succeeded themselves.

It is, therefore, ordered: that said causes be and they are hereby revived and shall be carried on and concluded in each of the above entitled cases in the names of the City of Marysville, L. N. Cole, as Mayor, R. E. Long, G. F. Bauman, Ed Hall, J. H. Reynolds, Oscar Terry, W. E. Miller, E. G. Filbert and E. C. Webber, as Councilmen, and Edgar C. Bennett, as City Attorney, and P. Hayes, as Marshal of said City of Marysville.

2. That that portion of Finding No. 81 of the Report of the Special Master, reading as follows, is erroneous and should be stricken out of said finding:

"The McCracken and Greenleaf fires were at tanks of the Sinclair Company, equipped with McDonald Duplex Vents and loose manhole covers, the same or similar to those of the Company at Marysville, and at McCracken the

top of the vertical gasoline tank was blown out the kero-
[fol. 80] sene tank exploded and was lifted off the founda-
tion and thrown to the ground fifteen feet therefrom."

It is, therefore, ordered that the above quoted portion of Finding No. 81 of the Special Master be and the same is hereby stricken out.

3. It is by the Court further found that the exceptions of the Standard Oil Company and the Sinclair Refining Company to that portion of Finding No. 81 following the first paragraph thereof, and not hereinbefore stricken out, should be and are reserved for decision by the Court and are hereby submitted to the Court.

4. It is further found that all questions arising upon the exceptions of the defendants to the findings of the Special Master, in each of the above entitled cases, should be and they are hereby reserved and submitted to the Court for decision, and the Court hereby takes all questions reserved and submitted to the Court under consideration for future decision.

It is further ordered, that the defendants be, and they are hereby given until the 4th day of June, 1925, in which to make, serve and file a brief herein; and the plaintiffs are hereby given ten (10) days thereafter in which to make, serve and file a counter brief herein.

And these causes are by the parties submitted to the Court for future decision upon the questions and under the conditions above recited.

John C. Pollock, Judge.

O. K.: Harry W. Colmery, Attorney for Defendants.

O. K.: Earle Evans, Attorney for Standard Oil Company.

O. K.: Thomas F. Doran, Attorney for Sinclair Refining Company.

In United States District Court

Decree—Filed Dec. 22, 1925

Now upon the consideration of the premises, after argument of solicitors and submission of proofs, for the respective parties,

[fol. 81] It is by the Court considered, ordered, adjudged and decreed in the above consolidated cases, with direction to the Clerk to file a copy of this decree in each of the separate cases as above entitled, as follows:

1. That each of the exceptions of the defendants taken and filed to the report of the Special Master be, and the same are hereby, denied and overruled. To which action of the Court the defendants, and each of them, duly except and excepts.

2. That the exception of the plaintiffs to that portion of Finding No. 81 of the Special Master not heretofore by agreement of the parties, by journal entry signed by the Court, stricken out, be and the same is hereby denied and overruled; to which action of the Court the plaintiff in each of the above entitled cases duly excepts.

3. That the motion of the plaintiffs to confirm the report of the Special Master in the above consolidated cases, as modified by order of the court dated the 2nd day of May, 1925, be and the same is hereby sustained, and said report, modified as aforesaid, is accordingly hereby approved and confirmed; to which action of the Court the defendants, and each of them, duly except and excepts.

4. That Charles Blood Smith, Special Master appointed by the court to take proofs in said consolidated cases, and make his report to the Court, be and he is hereby allowed the sum of $5,000.00 for his services, which shall be paid by the defendants as costs in this case.

5. That under the order of the Special Master there was deposited with him by the parties, to defray accruing costs, sums respectively as follows:

By the plaintiff, Standard Oil Company, the sum of	$442 33
By the plaintiff, Sinclair Refining Company the sum of	442 33
By the City of Marysville, Kansas, the sum of	393 86
Aggregating a total so deposited of	$1,278 52

That the Special Master, therefrom, has paid to Paul Harvey, for tak-

ing and transcribing the testimony, the sum of	$840 71	
That the Special Master has paid from said deposits the further sum of	44 00	
[fol. 82] for stenographer's fees in transcribing his said report.		
That the Special Master has expended from the deposits aforesaid, as and for his expenses, including hotel bills and railroad fares and incidentals, the sum of	145 00	
Aggregating a total expenditure of		$1,029.71
That there remains in the hands of the Special Master, from the funds deposited as aforesaid, a balance of		248 81
That the Standard Oil Company has paid out for witness fees, including per diem and mileage in attendance upon the hearing herein, the sum of which it claims as costs in this action.		188 80
That the Sinclair Refining Company has paid out for witness fees, including per diem and mileage in attendance upon the hearing herein, the sum of which it claims as costs in this action.		111 20
That the City of Marysville, Kansas, has paid out for witness fees, including per diem and mileage in attendance upon the hearing herein, the sum of		486 25
Aggregating a total paid out by the parties hereto for witness fees, mileage, etc., of		$786 25

For all of which sums the parties, respectively have made claims which are filed with the report of the Master herein. For which amounts the Special Master recommends each should have credit in the taxation of costs in the decree to be entered herein.

6. That it is hereby ordered, adjudged and decreed that the action of the Special Master in requiring the deposit by the respective parties of the sums aforesaid, be and the same is hereby approved and confirmed; and the amounts paid out by the Special Master and by the respective parties hereto, be and the same are hereby approved and confirmed; and that the same be and said sums are hereby taxed as costs in this action, and ordered paid as hereinafter decreed.

7. That the defendants be, and each of them is hereby permanently and perpetually restrained and enjoined,

[fol. 83] (a) From enforcing or attempting to enforce Ordinance No. 350 of the ordinances of the City of Marysville, Kansas, in so far as the same requires, or attempts to require that the tanks for the storage of gasoline, kerosene, and naphtha, distillate, fuel oil, crude oil, and other inflammable and combustible liquids, be buried at least three feet under ground; and

(b) From arresting or prosecuting, or attempting to arrest or prosecute, or to cause the arrest or prosecution of any agent or employee of the plaintiffs, or either of them for constructing, maintaining and operating any tank or tanks above ground in the City of Marysville, Kansas for the storage of or in which there is stored any of the products above named. To which action of the Court, the defendants, and each of them, except and excepts.

8. That plaintiffs do have and recover of, from and against the defendants all costs in this action, as above set out, including the Master's fee, the reporter's and stenographer's fees, the expenses of the Special Master, witness fees, including mileage and per diem, and in addition thereto, the Clerk's costs herein, taxed at $, due credit to be given on all deposits made or sums paid out by the City of Marysville; the Special Master to be charged with the unexpended balance in his hands as shown by said report, to wit: $248.81.

9. That this decree be entered by the Clerk, and thereon let execution issue.

John C. Pollock, Judge.

In United States District Court

Opinion—Filed Nov. 28, 1925

The above suits have been instituted for the same purpose and on the same grounds, against same parties, for the purpose of trial and decree were consolidated and heard as one case. The purpose of the suits is to procure a decree perpetually enjoining defendant City, its Mayor, Common Council, City Attorney and City Marshal from enforcing the provisions of an Ordinance of Defendant City number 350, entitled, "An Ordinance regulating the storage of gasoline, kerosene, naphtha, distillate, fuel oil, crude oil and other inflammable and combustible liquids within the City [fol. 84] of Marysville, Kansas, and repealing Ordinance No. 333 and Section 4 of Ordinance No. 237."

The material and offending sections of said Ordinance material here, read, as follows:

"Section 1. It shall be unlawful for any person, firm or corporation to keep or store within the corporate limits of the City of Marysville, Kansas, any gasoline, kerosene, naphtha, distillage, fuel oil, crude oil, or other inflammable or combustible liquid otherwise than in tanks, barrels or other containers which shall be buried at least three feet under ground.

"Sec. 2. Any person, firm or corporation who shall maintain any underground tank yard shall keep same fenced securely and shall keep at least six inches of gravel, chat, cinders or other large aggregate over the said area so occupied by tanks, and shall keep and maintain such tank yard in a clean, orderly manner, free from rubbish, weeds, trash or other inflammable substances.

"Sec. 3. This ordinance shall in no case apply to the storage of any crude oil, distillate or fuel oil in containers of a capacity of 500 gallons or less, but only one such 500 gallon container shall be permitted on each premises, nor, shall it apply to the storage of gasoline, kerosene or naphtha in quantities of less than ten gallons, all of which commodities in the quantities mentioned and permitted by this section shall be kept and stored in the manner as now provided by existing ordinance.

"Sec. 4. Ordinance number 333 and Section 4 of Ordinance number 237 are hereby expressly repealed.

"Sec. 5. Any person, firm, or corporation violating any of the provisions of this ordinance shall upon conviction be adjudged to pay a fine of $25.00 for each such violation, and each day that any of the commodities herein referred to are stored in violation of the terms hereof shall constitute a separate and distinct offense hereunder.

"Sec. 6. Any person, firm or corporation now storing any of the commodities herein mentioned in a manner otherwise than that herein provided shall be given until the 10th day of November, 1923, in which to bring themselves within the provisions hereof and comply herewith."

The grounds on which the validity of this Ordinance are challenged are: (1) It is violative of the provisions of section one of the Fourteenth Amendment to the Constitution of the United States; (2) That it is repugnant to the rights [fol. 85] of plaintiff at the common law and under the Constitution and laws of the State of Kansas; (23) that it is ultra vires the powers of Mayor and Council of defendant city for that it is arbitrary, capricious, discriminatory, unreasonable and subversive of the private rights of plaintiffs and is an abuse of the exercise of the power conferred upon the Mayor and Council of defendant city, and hence deprives plaintiffs of their property without due process of law.

On issues joined the consolidated case was referred to Honorable Charles Blood Smith, a member of the bar of this court, of the highest ability, integrity and learning in the law and practice in Federal Courts of law and equity, who took the proofs, hearing the witnesses for the respective parties testify ore tenus, read and considered the voluminous proofs taken, heard arguments of solicitors for the respective parties, reported his findings and conclusions to the court. Defendant has taken many exceptions to this report. The plaintiffs also took certain exceptions to a single finding of fact made by the Master, in part, which, by consent of the Master and the parties now stands stricken out of the report, and the case stands submitted for decision on the exceptions of defendants to the report

of the Master, and on motion of plaintiffs to confirm the report and for decree as recommended.

Preliminary it may be said of this case, what gave rise to the controversy here presented had its origin in a fire which occurred at the tanks of the Standard Oil Company at the City of Hays, this State, in November 1919, in which an oil tank exploded, causing a severe conflagration and loss of life, the tanks there causing the damage being above ground. However, it is found by the Master from the proofs the Standard Oil Company has and uses some twelve thousand above ground tanks similar to those of plaintiffs located at Marysville; that within five years past at these twelve thousand tanks there had occurred but sixty-six fires, and that the explosion of the tank at Hays in November 1919 was the only one that had ever happened, and that this was occasioned primarily from faulty equipment of the tank and not because it was constructed above ground.

After a long, faithful and arduous hearing and consideration of the proofs and arguments of solicitors for the respective parties the Master arrived at the conclusion the ordinance is as charged by plaintiffs, arbitrary, unreasonable, discriminatory and confiscatory of plaintiffs' property [fol. 86] rights guaranteed under the Constitution of the United States by the common law and the Constitution of this State.

As all this is found on somewhat conflicting proofs, taken and heard with the witnesses before the Master, who had a better opportunity to judge of their credibility than has this court; and, further, as the many exceptions to the findings of fact made by the Master and taken by defendant cannot be considered save by a reading of the entire proofs, I have contented myself with such a study of the proofs as show the many findings excepted to are supported by ample proofs, and from the findings made by the Master, on the proofs, I am of the opinion no other decree can enter in the consolidated case than that by the Master recommended. Indeed, from the study I have given the question, from all the proofs, I am of the opinion the danger attendant upon gasoline and kerosene kept in large tanks buried underneath the ground, as by the ordinance required, would be much more hazardous to the adjoining property owners and their lives and habitations than like tanks above the

ground, as kept by plaintiffs in this case. This arising from the difficulty of inspection of underground tanks to discover the escape of the oil or gasoline therefrom, and the greater opportunity of such hidden tanks becoming leaky from corrosion, and other causes.

It follows, in my judgment, equity in this case between the parties compels the overruling of the exceptions taken by defendant, the adoption of the report of the Master, and its findings, and conclusions, as moved by plaintiffs.

It is so ordered. There will be a decree enter- accordingly.

John C. Pollock, Judge.

Kansas City, Kansas, Nov. 28, 1925.

IN UNITED STATES DISTRICT COURT

PETITION FOR APPEAL AND ORDER ALLOWING SAME—Filed Mar. 20, 1926

To the Honorable John C. Pollock, District Judge of the District Court of the United States for the District of Kansas:

The above named defendants, feeling themselves aggrieved by the decree made and entered in this case on the 22nd day of December, 1925, do hereby appeal from said decree to the United States Circuit Court of Appeals, for the Eighth Circuit, for the reasons specified in the assign- [fol. 87] ment of errors, which is filed herewith, and they pray that their appeal may be allowed, and that a transcript of the record, proceedings and papers on which said decree was made, duly authenticated, may be sent to the United States Circuit Court of Appeals, for the Eighth Circuit.

And your Petitioners further pray that the proper order touching the security to be required of them to perfect their appeal be made.

Harry W. Colmery, Edgar C. Bennett, Solicitors for Defendants.

The petition for Appeal is granted and the appeal allowed on giving bond conditioned as required by law in the sum of $10,000.00.

John C. Pollock, Judge.

Dated this 19th day of March, 1926.

IN UNITED STATES DISTRICT COURT

ASSIGNMENT OF ERRORS—Filed March 20, 1926

The defendants respectfully make the following Assignment of Errors, in the above entitled cause, to be relied upon by them, in their Appeal from the decree made and entered in the above entitled cause on the 22nd day of December, 1925.

1

The Court erred in finding that the storage of gasoline and kerosene in tanks 10 feet in diameter and 16 feet in length, buried underneath the ground, as required by Ordinance No. 350, of the City of Marysville, is more hazardous to life and property than the storage in tanks above ground.

2

The finding and decree of the Court is against the law and equity of the case, and against the Findings of Fact contained in the Master's Report, and contrary to the same.

3

The Court erred in permanently and perpetually restraining and enjoining the defendants from enforcing, or attempting to enforce, Ordinance No. 350 of the City of Marysville, Kansas, insofar as it requires, or attempts to require, that the tanks for the storage of gasoline, kerosene, naptha, distillate, fuel oil, crude oil, and other inflam-
[fol. 88] mable and combustible liquids, be buried at least 3 feet under ground; and from arresting or prosecuting, or attempting to arrest or prosecute, or cause the arrest or

prosecution of, any agent or employee of the plaintiff, or either of them, for constructing, maintaining, and operating any tank or tanks above ground in the City of Marysville, for the storage of, or in which there is stored, any of the products above named.

4

The Court erred in finding and deciding that Sections numbered 1 and 3 of Ordinance No. 350 of the City of Marysville and each and every provision thereof is arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of the plaintiffs, and void.

5

The Court erred in finding and deciding that Ordinance No. 350 of the City of Marysville, Kansas, is arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of the plaintiff, and void.

6

The Court erred in overruling defendant's exceptions to the Findings of Fact and Conclusions of Law of the Special Master, and in sustaining the plaintiffs' motion to and in approving and confirming said Findings of Fact and Conclusions of Law, as modified by the order of the Court dated May 2, 1925, to each of which rulings exceptions were taken by the defendants at the time.

7

The Court erred in not sustaining the 1st exception taken as aforesaid by the defendants, "that said Master erred in finding that the Standard Oil Company erected its plant and tanks for storing gasoline and kerosene with the knowledge and consent of the City of Marysville, and that its right or authority to erect and maintain said tanks for such purpose was never denied or questioned until October 8, 1923," whereas, he should have found, as stipulated by the parties in the record, that the records of the City of Marysville do not show that the city ever granted the Standard

Oil Company any permit to locate and maintain said tanks, and that ineffectual efforts were made to regulate by ordinance the storing of gasoline and kerosene in the City of Marysville two years prior to October 8, 1923.

[fol. 89]

8

The Court erred in not sustaining the 2nd exception taken as aforesaid by the defendants, "that said Master erred in finding that each of the tanks of Standard Oil Company at Marysville had a capacity of approximately 17,000 gallons," whereas he should have found that each of said tanks had a capacity of approximately 11,000 gallons.

9

The Court erred in not sustaining the 3rd and 21st exceptions taken as aforesaid by the defendants, "that said Master erred in finding that the venting devices with which the tanks of the Standard Oil Company and Sinclair Refining Company are equipped are sufficient to carry off excess vapors arising from the liquid content, even under conditions of extreme heat, and are sufficient and safe equipment," for the reason that it conflicts with Finding No. 81 wherein said Master found that "gasoline and kerosene are of such character thas even when the most modern safety devices are in use a relaxing of conditions, a careless act or an accident, or failure in the operation of the safety devices, or the presence of extreme heat, may result in fires or explosions most destructive to life and property."

10

The Court erred in not sustaining the 4th exception taken as aforesaid by the defendants, "that said Master erred in finding that no complaint was ever made or fault found with the construction, equipment or manner of operation of the Standard Oil Company's tanks," whereas, the record shows, as stipulated by the parties, that ineffectual efforts were made to regulate the keeping and storage of gasoline and kerosene two years prior to the passage of Ordinance No. 350, in question.

11

The Court erred in not sustaining the 5th exception taken as aforesaid by the defendants, "that said Master erred in admitting over the objection of defendants, testimony to show that the construction, equipment and manner of operation of the Standard Oil Company's tanks are standard and of the kind and character generally employed by it at all points other than the City of Marysville," and overruled defendants' motion to strike out said testimony, and considered said evidence, to which rulings defendants at the time excepted.

[fol. 90]

12

The Court erred in not sustaining the 6th exception taken as aforesaid by the defendants, "that said Master erred in admitting, over the objection of defendants, testimony to show that the Standard Oil Company, during the five years last past, had had only 66 fires, at 12,000 tanks similar to the ones at Marysville, and of those the one at Hays, Kansas, was the only one which exploded, or from which fire spread to, or injured other property or persons." No attempt was made to show the surrounding circumstances and conditions at any other tanks, nor does such proof constitute equity.

13

The Court erred in not sustaining the 7th exception taken as aforesaid by the defendants, "that said Master erred in finding that the tank of the Standard Oil Company which exploded at Haws, Kansas, was not equipped with a manhole vent similar to the manhole vent on the tanks at Marysville." The record shows that it is similar in every respect, including venting devices, except that the manhole, although having the same sized opening, has a different valve arrangement to take care of excess vapors. For the purpose of Finding No. 23, the Master finds the tank at Hays to be similar.

13a

The Court erred in not sustaining the 8th and 24th exceptions taken as aforesaid by the defendants, "that there

was no evidence tending to show that any tanks similar in construction, equipment and manner of operation to those maintained by the Standard Oil Company at Marysville, Kansas, ever exploded, or that fire from any such tank ever spread to, or otherwise injured, either the property or the safety of persons," whereas, he should have found, as requested by the defendants, that "there have been instances when tanks containing gasoline and kerosene and equipped in the same or similar manner, have burned and (or) exploded, causing death and serious destruction of property."

14

The Court erred in not sustaining the 9th exception taken as aforesaid by the defendants, "that said Master erred in finding that the burying of the tanks of either of the plaintiffs is more dangerous to property and persons than the maintenance and operation of said tanks above ground," whereas he should have found that the storage of gasoline [fol. 91] and kerosene in tanks buried underground is less dangerous to property and persons than in tanks above ground; and having given the above finding complained of, said Special Master ought to have found, as requested by the defendants, that there was a substantial conflict, and fair difference of opinion as to whether storage above ground or under ground is more hazardous to public safety, and that all testimony to the effect that above ground storage is less hazardous is based on general conditions, and not on conditions existing at Blocks 40 and 71 in the City of Marysville, whereas the testimony that underground storage is less hazardous is based both on general conditions and conditions in and around Blocks 40 and 71 in the City of Marysville.

15

The Court erred in not sustaining the 10th and 11th exceptions taken as aforesaid by the defendants, "that said Master erred in finding that the tanks of the Standard Oil Company are located in a sparsely populated section of said city, and that there are no changed conditions in the

buildings or improvements around the tanks and premises of either of the plaintiffs, or in their vicinity, which would warrant or justify that said tanks be buried as required by Ordinance No. 350," for the reason that the testimony in the record shows, and the master has found in findings Nos. 61, 62, 69, 70, and 71, facts as to the location of houses and dwellings, the rapid growth of the City of Marysville, the shortage of residences, active building activity, public and private, and that the property in the vicinity of these tanks is the most valuable for building purposes, all of which is contrary to the Findings above excepted to.

16

The Court erred in not sustaining the 12th exception taken as aforesaid by the defendants, "that said Master erred in admitting, over the objection of the defendants, testimony to show that the tanks in question do not present a greater fire hazard than would a frame building or a stock of groceries in a frame building at the same location," whereas said Master should have found, as requested by the defendants, that the City Council may make reasonable classifications of private property and business, for the purpose of regulating them in the interest of public safety, and a classification putting frame buildings and frame business structures in one class, and the storage of gasoline and kerosene and petroleum products in another, is a proper classification, and the evidence does not show [fol. 92] and there is no presumption that proper regulations have not been made of frame buildings and business structures in the interest of public safety.

17

The Court erred in not sustaining the 13th exception, taken as aforesaid by the defendants, that "said Master erred in finding that the dwelling house closest to the Standard Oil Company's tanks is more than 98 feet distant," for the reason that said Finding is contrary to the evidence and misleading, as the record shows not only that there is a house 93 feet west of the tanks, but that there are large frame coalsheds, and other frame structures, and

combustible property within 27 feet of said tanks, as found in Finding No. 62.

18

The Court erred in not sustaining the 14th exception, taken as aforesaid by the defendants, that "said Master erred in finding that large quantities of cinders have been and now are used for ballast on the tracks of the Union Pacific Railroad Company, which is 20 feet from the Standard Oil Company's tanks," whereas the Master ought to have found, as requested by the defendants, that the ballast on said tracks is of cinder and Sherman Hill gravel and that pipes buried on this right-of-way for at least 11 years show that there is little danger of corrosion from corrosive acids created by waters passing over cinders.

19

The Court erred in not sustaining the 15th exception, taken as aforesaid, by the defendants, that "said Master erred in finding that the natural flow and drainage is from the railroad tracks of the Union Pacific Railroad Company upon and over the property of the Standard Oil Company," for that the record does not show any testimony whatever to support that finding.

20

The Court erred in not sustaining the 16th exception, taken as aforesaid by the defendant, "that said Master erred in finding that crude oil is more dangerous from the standpoint of public safety than is gasoline or kerosene, and presents a greater hazard;" the master found (Finding 79) that neither of the plaintiffs nor anyone else has ever stored crude oil in the City of Marysville and no rights could be effected by determining the comparative [fol. 93] hazard of crude oil and gasoline and kerosene. The testimony shows that the hazard from crude oil depends upon its percentage of gasoline content and which varies from nothing to eighty per cent and the hazard of crude oil cannot be determined without knowing the gasoline content of the specific crude oil in question.

21

The Court erred in not sustaining the 17th exception, taken as aforesaid by the defendants, in finding that "under Ordinance No. 237, not more than five gallons of gasoline, fuel oil or motor spirits could be stored above ground in any building, or upon any premises in any one container, and not to exceed two containers to a premise," whereas, under Ordinance No. 350, ten gallons could be stored. The Court did not correctly interpret said ordinance, as Ordinance No. 350 is a later ordinance and in case of conflict, governs.

22

The Court erred in not sustaining the 18th exception, taken as aforesaid by the defendants, "in admitting evidence, over the objection of the defendants, to show the number of automobiles and their kind and character owned in the City of Marysville, the number of garages operated, and the capacity of tanks of the various makes of automobiles, and in finding that under the provisions of Ordinances Nos. 237 and 350, it is unlawful for any citizen of Marysville to keep more than five gallons of gasoline in the tank of his automobile, and that every garage-keeper in Marysville, who stores cars, the tanks of which contain gasoline, is guilty of an offense under the ordinance." The Court has misinterpreted Ordinance No. 350; it does not pretend to regulate the transportation or use of gasoline and kerosene, but only regulates the keeping and storing of said products (Finding 77), and for the further reason that neither of the plaintiffs operates any automobiles in the city for any purpose, other than the transportation of petroleum products, nor do either of them own, operate, or maintain a garage or garages in said city (Finding 78).

23

The Court erred in not sustaining the 19th exception, taken as aforesaid by the said defendants, that "said Master erred in finding that Ordinances Nos. 237 and 350 permit and authorize a discrimination in favor of those who keep and store crude oil, distillate and fuel oil in quantities of [fol. 94] less than 500 gallons above ground, and against

those who wish to keep and store the same commodities in quantities of 500 gallons or more above ground; and against those who wish to store and keep ten gallons of gasoline, fuel oil or motor spirits on their premises in one container above ground, and against those who wish to keep and store ten gallons or more of gasoline, kerosene or naphtha above ground," for the reason that said Master erroneously interpreted said Ordinances, and ought to have found, as requested by the defendants, that Ordinance No. 350 makes a reasonable classification as between gasoline and kerosene on the one hand and fuel oil and distillate on the other; and a reasonable classification as between the keeping and storing of ten gallons or less of gasoline or kerosene on the one hand and quantities in excess of ten gallons on the other; and a reasonable classification as between the keeping and storing of 500 gallons of fuel oil and distillate on the one hand, and quantities in excess of 500 gallons of said products on the other hand, and that said ordinance applies equally to all persons, firms or corporations who keep and store like amounts of gasoline and kerosene in the one case, and like amounts of distillate and fuel oil in the other, and is discriminatory and does not deny the plaintiffs the equal protection of the law.

24

The Court erred in not sustaining the 21st exception taken as aforesaid by the defendant, "that said Master erred in finding that all of the equipment of the Sinclair Refining Company is maintained and operated in a first class, careful, prudent and safe manner," whereas, the testimony in the record shows that weeds and vegetation were allowed to grow up high around the tanks, that the same are much in need of paint, are rusty at the seams, and show moist spots at the seams.

25

The Court erred in not sustaining the 23rd exception taken as aforesaid by the defendants, "that said Master erred in refusing to find as requested that 'citizens of Marysville have assigned as a reason for not building in the vicinity of Block 71 their fear of the danger of the explosion of the oil tanks.' ".

26

The Court erred in not sustaining the 25th exception taken as aforesaid by the defendants, "that said Master [fol. 95] erred in refusing to find that it is very doubtful that said acid found in Blocks 40 and 71, is sulphuric acid, and further erred in finding that it might take a term of years for corrosion to occur underground at the Standard Oil property," whereas, he ought to have found that it would take a term of years for corrosion to even start and that there would be no difficulty in protecting against it.

27

The Court erred in not sustaining the 26th exception taken as aforesaid by defendants, "that said Master erred in finding that under the conditions in around Blocks 40 and 71 in the City of Marysville, there would be vibration that might weaken the seams in tanks buried underground," whereas, he ought to have found, as requested by the defendants, that it is very doubtful whether under the conditions existing, in and around the Blocks 40 and 71 in the City of Marysville, that there would be vibration sufficient to weaken the seams in tanks buried underground and any leakages from such cause is a very remote possibility.

28

The Court erred in not sustaining the 27th exception taken as aforesaid by the defendants, "that said Master erred in finding that the evidence showed that the seams of a tank underground might be weakened by temperature changes to such an extent as to cause the tank to leak," whereas, he ought to have found, as requested by the defendants, that the probability that the seams of a tank underground, would be weakened by temperature to such an extent as to cause leaks is very remote.

29

The Court erred in not sustaining the 28th exception taken as aforesaid by the defendants, "that said Master erred in refusing to find that the soil in Blocks 40 and 71, is so nearly impervious as to make it quite improbable that

any leaks so small as not to be discovered would seep through the soil in a lateral direction, and the possibility of any gasoline getting into the sewers is too remote to present any serious danger."

30

The Court erred in not sustaining the 29th exception taken as aforesaid by the defendants, "that said Master erred in refusing to find as requested by the defendants that [fol. 96] the storage of gasoline in quantities of 10,000 gallons in a tank in a residential district is very hazardous."

31

The Court erred in not sustaining the 31st exception taken as aforesaid by the defendants, "that said Master erred in refusing to find that a large percentage of fires at storage stations originate in or about warehouses, caused by backfires of the motors in the tank wagons, sparks from gasoline pumping engines, and other causes, and that the danger from fires and explosions at storage tanks due to fire being communicated to them from tank wagons, warehouses, engines and other combustible matter, is almost entirely eliminated when the tanks are buried underground, on account of the protection of the covering of 3 feet of earth." Testimony in the record shows that all of the witnesses on both sides speaking on that point testify to this effect.

32

The Court erred in not sustaining the 32nd exception taken as aforesaid by the defendants, "that said Master erred in refusing to find as requested, that there is more danger of having an explosive mixture in tanks above ground than in those underground" for the reason that the testimony in the record shows the temperature changes give rise to explosive mixtures, and temperature changes are more extreme above ground than underground.

33

The Court erred in not sustaining the 33rd exception taken as aforesaid by the defendants, "that said Master

erred in refusing to find that there is much less danger to the public safety from explosion of a storage tank buried 3 feet underground, than from a similar tank above ground." The testimony of Henderson, the only witness speaking on this point, is to that effect.

34

The Court erred in not sustaining the 34th exception taken as aforesaid by the defendants, "that said Master erred in refusing to find that the City Council acted in good faith in passing Ordinance No. 350, believing that the regulation therein described was in the interest of the public safety." This fact was conceded by Counsel for plaintiffs during argument and is a fair conclusion from the presumption which attaches to the acts of the City Coun-
[fol. 97] cil, and from Findings Nos. LX, LXII, LXIX, LXX, LXXI, LXXVII, LXXVIII, LXXIX, LXXXI, LXXXII, LXXXIII, LXXXIV, LXXXV, and LXXXVI.

35

The Court erred in not sustaining the 35th exception taken as aforesaid by the defendants, "that the said Master erred in refusing to find that the City Council had reasonable grounds for believing that the storage of gasoline and kerosene in tanks buried 3 feet underground in Blocks 40 and 71 was more conducive to the public safety, life and property, than storage in said tanks above ground."

36

The Court erred in not sustaining the 36th exception taken as aforesaid by the defendants, "that said Master erred in refusing to find that Ordinance No. 350 and each and all of its provisions constitute a reasonable exercise of the police power of a city of the second class in Kansas, and is not arbitrary, capricious, and subversive of the rights of the plaintiffs."

37

The Court erred in refusing to admit, rejecting and failing to consider testimony offered by the defendants to show

that the regulations of the National Board of Fire Underwriters, and of the National Fire Protective Association, provide that "Outside underground storage is the safest storage possible, and inside the building storage the most hazardous," and, "That storage tanks should be placed underground to obtain the greatest measure of safety."

38

The Court erred in sustaining the plaintiff's exception to and in striking out that part of Finding No. 81, which reads as follows: "The record shows fires at five storage stations in Kansas: two in 1919, two in 1920, and one in December, 1923. The McCracken and Greenleaf fires were at tanks of the Sinclair Company, equipped with McDonald Duplex Vents and loose manhole covers, the same or similar to those of the Company at Marysville, and at McCracken the top of the vertical gasoline tank was blown out and the kerosene tank exploded and was lifted off the foundation and thrown to the ground fifteen feet therefrom," whereas, the [fols. 98 & 99] said Finding should have been modified to accord with the facts proved that the McCracken fire was at the tanks of the Sinclair Company and the K. T. Company, and the Greenleaf fire at the tanks of the Standard Oil Company; that in each instance, the tanks were equipped with McDonald vents and loose manhole covers, the same or similar to those at Marysville; and that at McCracken, a top of the vertical gasoline tank of the K. T. Company was blown out and the kerosene tank of that company exploded and was lifted off its foundation and thrown to the ground 15 feet away.

Harry W. Colmery, Edgar C. Gennett, Solicitors for the Defendants.

Bond on appeal for $10,000.00, approved and filed March 31, 1926, omitted in printing.

[fol. 100] IN UNITED STATES DISTRICT COURT

CONDENSED STATEMENT OF EVIDENCE—Filed April 15, 1927

Statement of evidence by Appellees in the above-entitled consolidated cases—Standard Oil Company and Sinclair Refining Company—in condensed narrative form required by equity rule No. 75, which each of said appellees deems essential to the decision of the questions presented by the appeal herein and desires incorporated into the transcript

Appellees in the above entitled consolidated cases, Standard Oil Company and Sinclair Refining Company, respectfully present for the approval of this Court the following condensed statement of the evidence in narrative form, to be incorporated in the transcript of record. This statement contains not only the evidence which appellants incorporated in their "Statement of Evidence—Narrative Form of Testimony," but also such additional portions of the evidence as said appellees deem essential to a decision of the questions presented by the appeal herein, the evidence of each witness being stated in the order in which the witnesses were called and appeared before the Special Master herein. Where deemed essential said evidence is quoted verbatim as it appears in the transcript of evidence taken by the Special Master.

I

At the opening of the hearing before the Special Master, by stipulation of the Sinclair Refining Company and the defendants, the following words were stricken out of paragraph 12 on page 7 of the answer:

[fols. 101 & 102] "Said tanks are only one and one-half blocks distant from the main business street of the City of Marysville, and * * *"

(Transcript of Evidence, Volume 1, page 2.)

II

Witnesses Called by Plaintiffs

1. F. E. Hays, Jr., a witness called by plaintiffs, testified as follows:

(Transcript of Testimony, Vol. 1, pp. 21-31)

Direct examination.

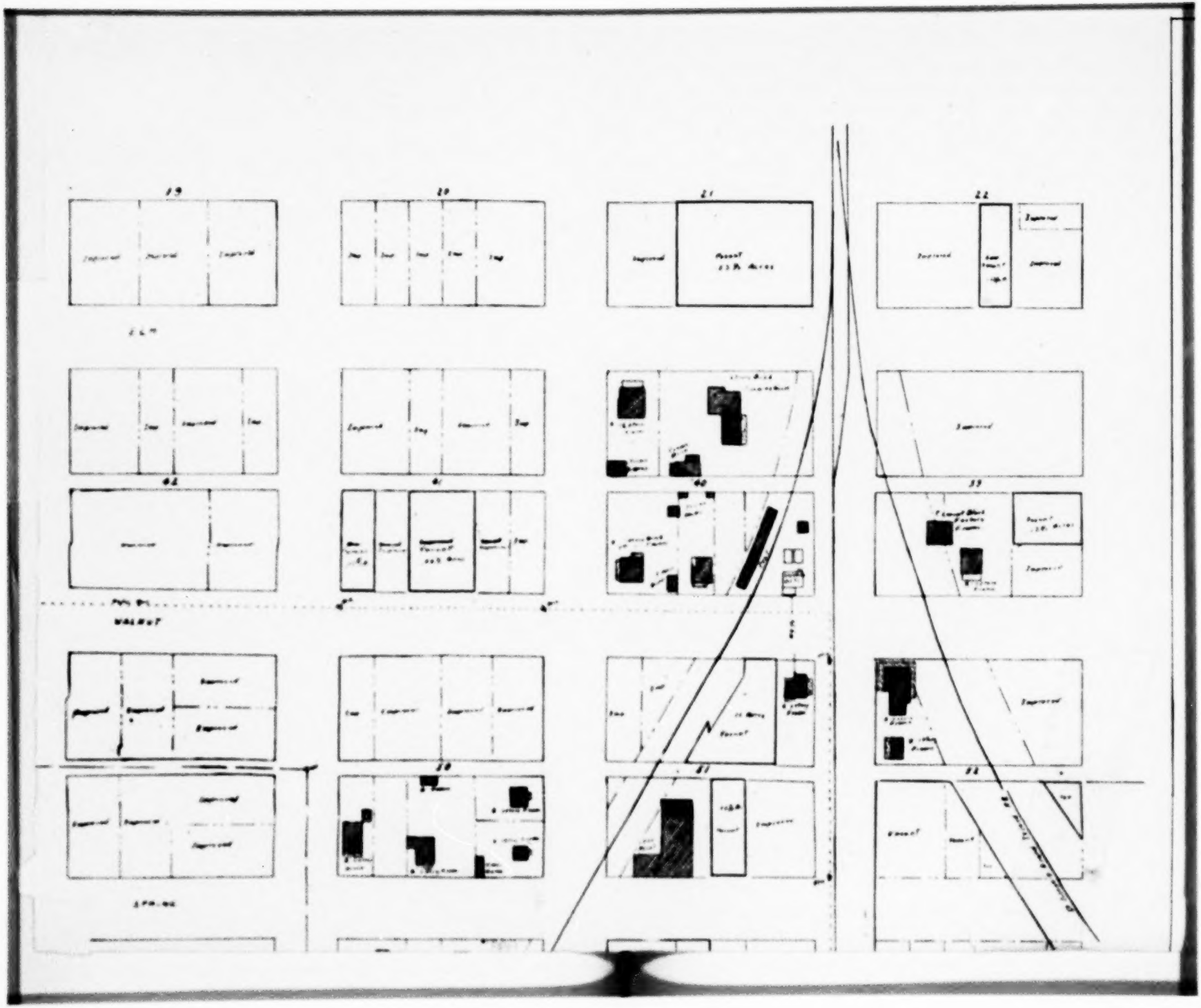
By Mr. Evans:

My name, place of residence and occupation are F. E. Hays, Jr., Marshall County, profession civil engineer, holding the position of county surveyor and county engineer of Marshall County. I was graduated from Lehigh University in 1907. I have had experience since that time in the general practice of civil engineering and construction. I have been continuously engaged in the profession with the exception of two years while I was attending K. S. A. C. (Kansas City Agricultural College.) I have prepared a map of the City of Marysville.

This map was marked Exhibit "A" by the Reporter and handed to the witness, who stated that the map is correct and shows the location of the various streets, alleys and improvements of the City of Marysville; that the legends entered thereon by witness are correct and enable one to locate the tracts of land and improvements in Marysville. The map was here offered and admitted in evidence, and is as follows:

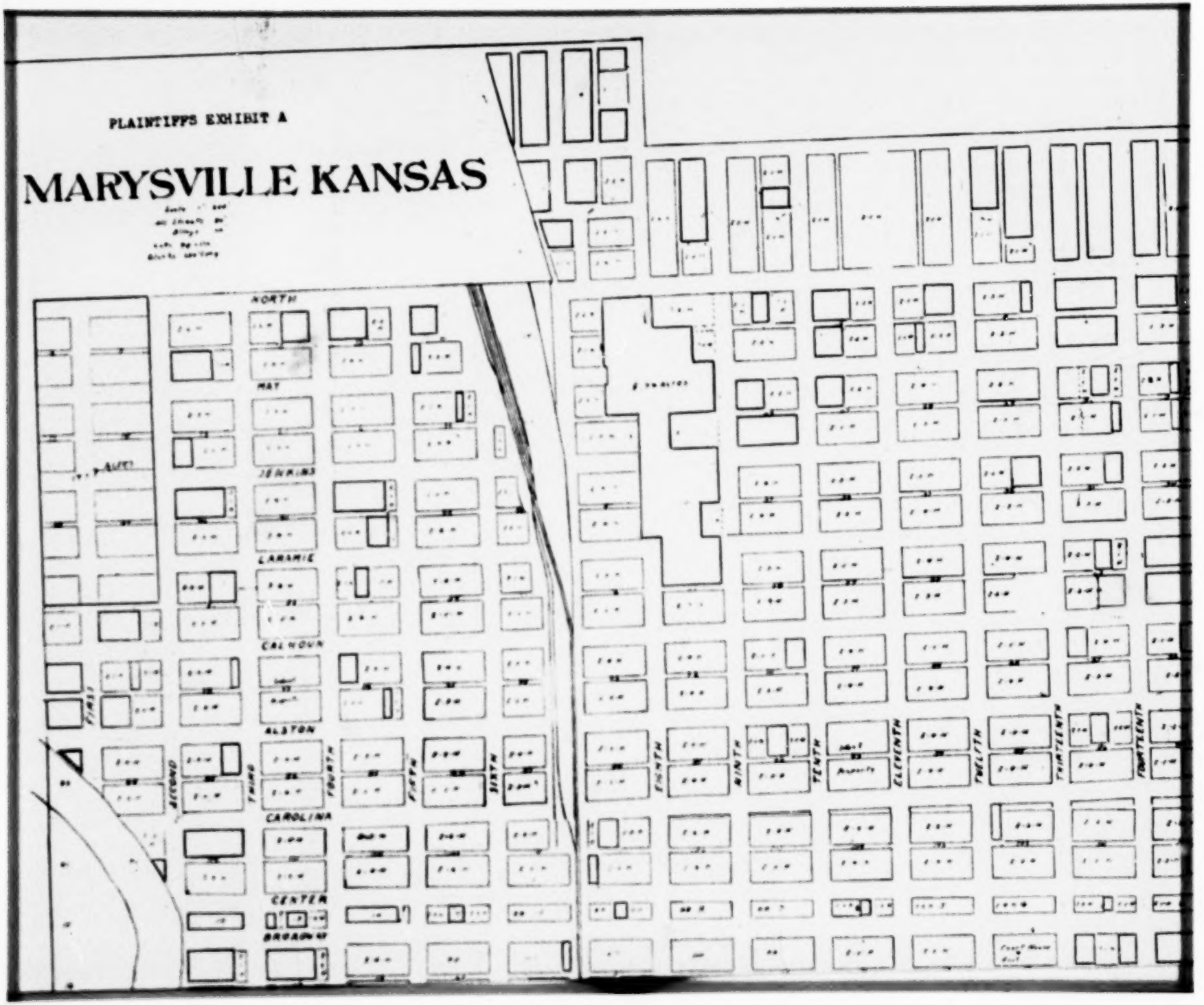
(Here follows Exhibit A, marked side folio pages 103 and 104)

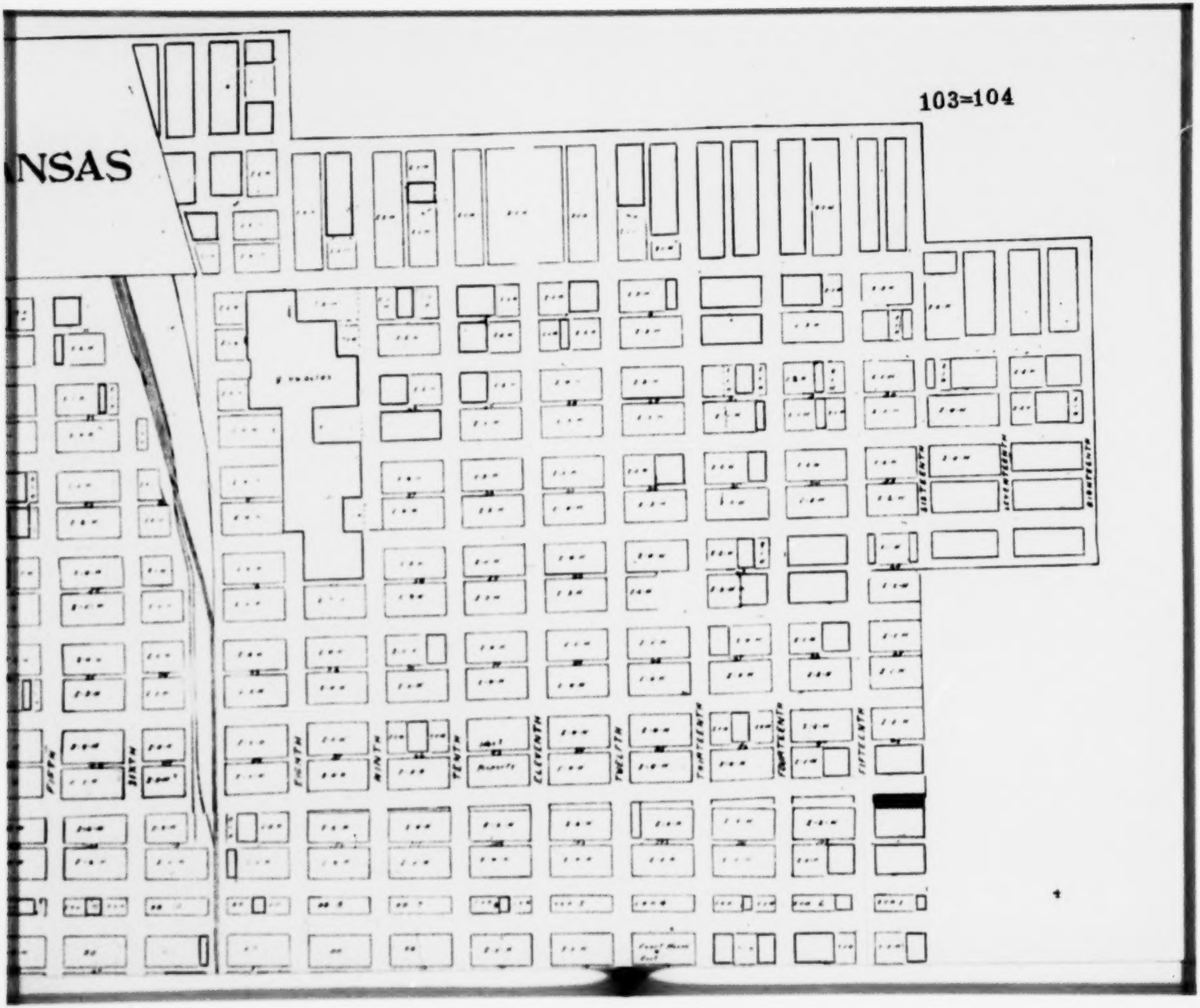
[fol. 105] Witness, in response to a question, referred to the section of the map showing the properties upon which plaintiffs operate their oil business, and stated that the nearest dwelling or improvement to the Standard Oil Company is 99 feet and 2 inches; that the nearest residence to the Sinclair Refining Company's plant is 58 feet; that these improvements are correctly shown on the map; that said improvements antedate the coming of witness



PLAINTIFFS EXHIBIT A

MARYSVILLE KANSAS




NSAS
103=104
FIFTH
SIXTH
EIGHTH
NINTH
TENTH
ELEVENTH
TWELFTH
THIRTEENTH
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FIFTEENTH
SIXTEENTH
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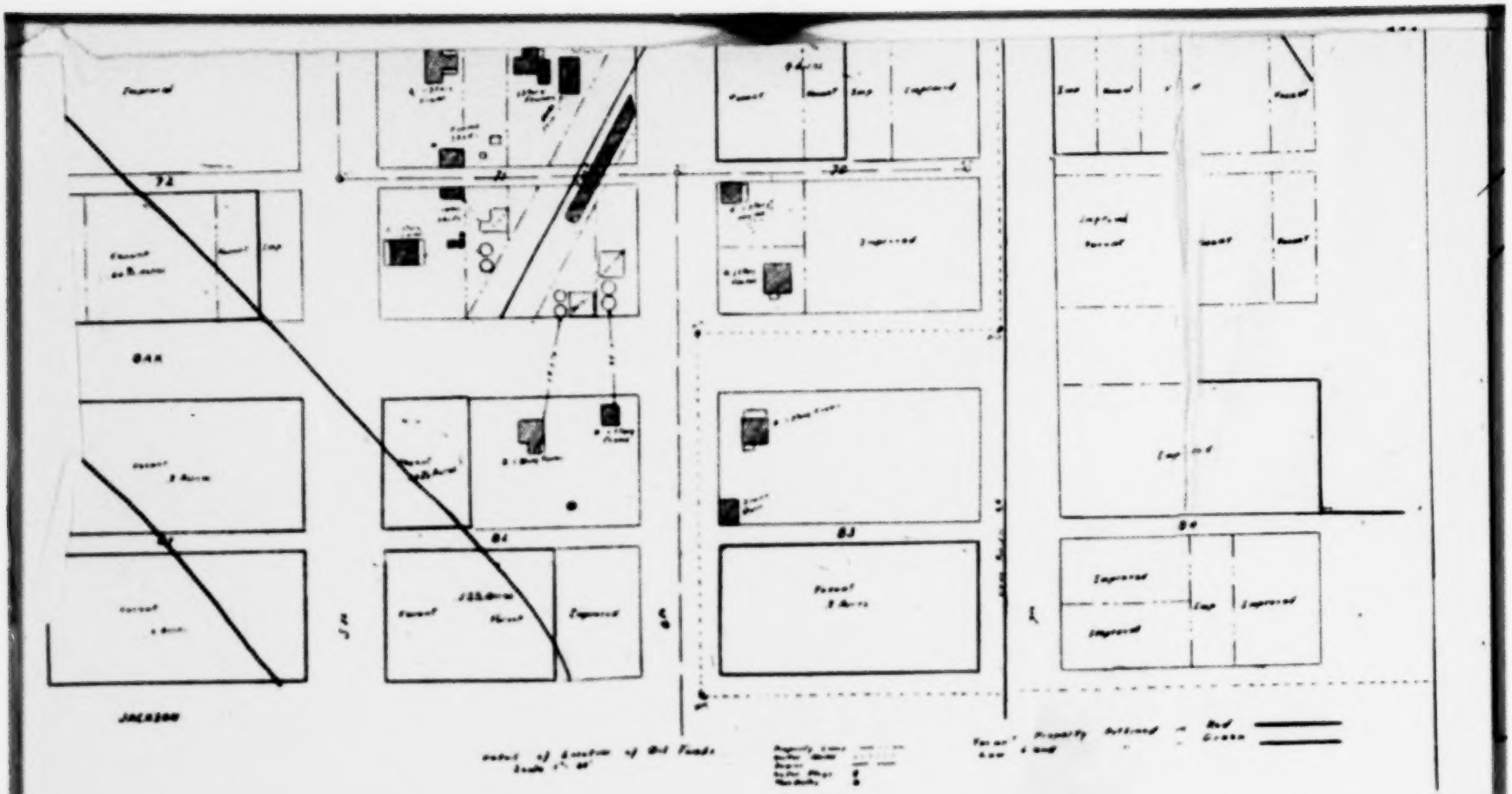
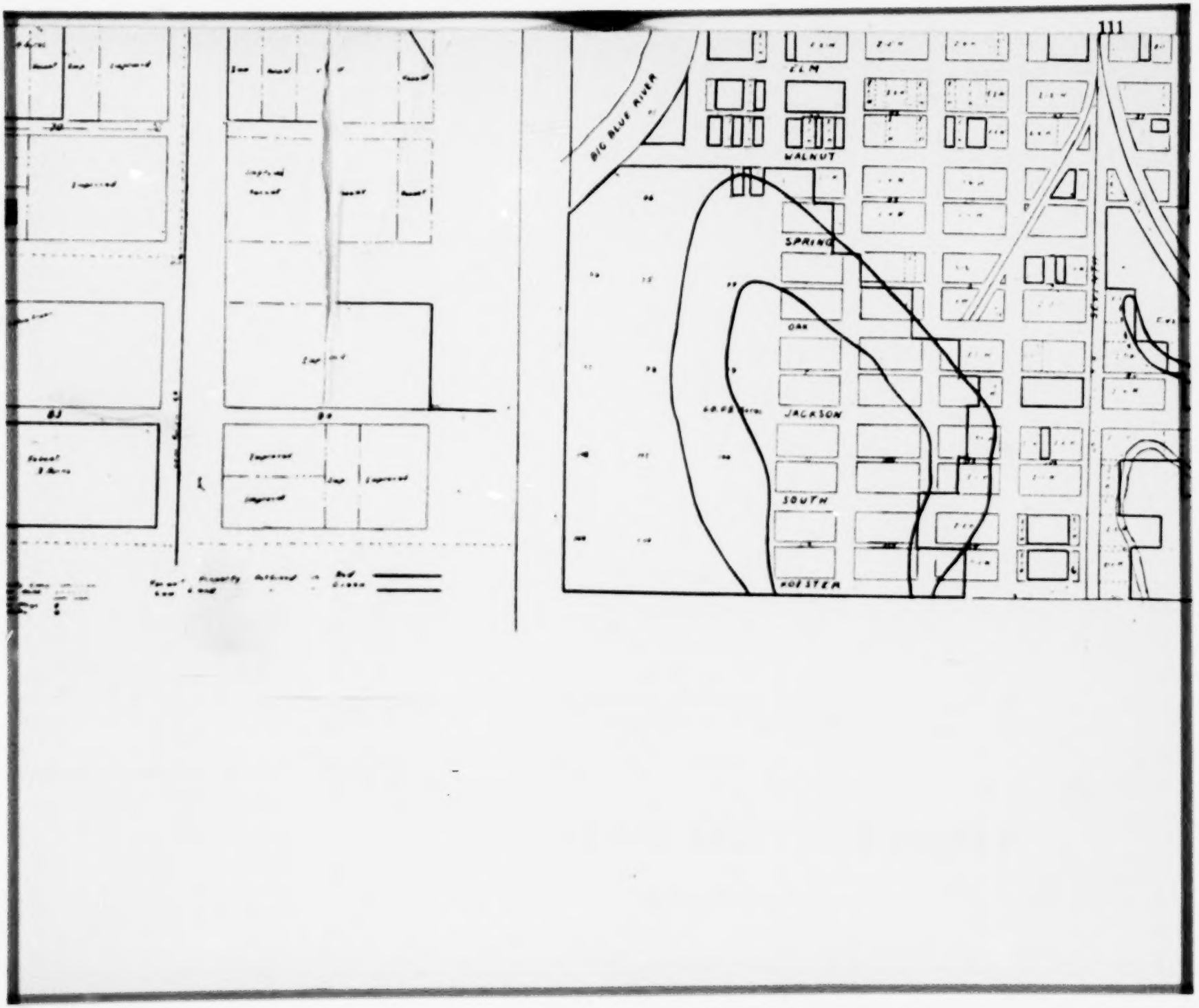
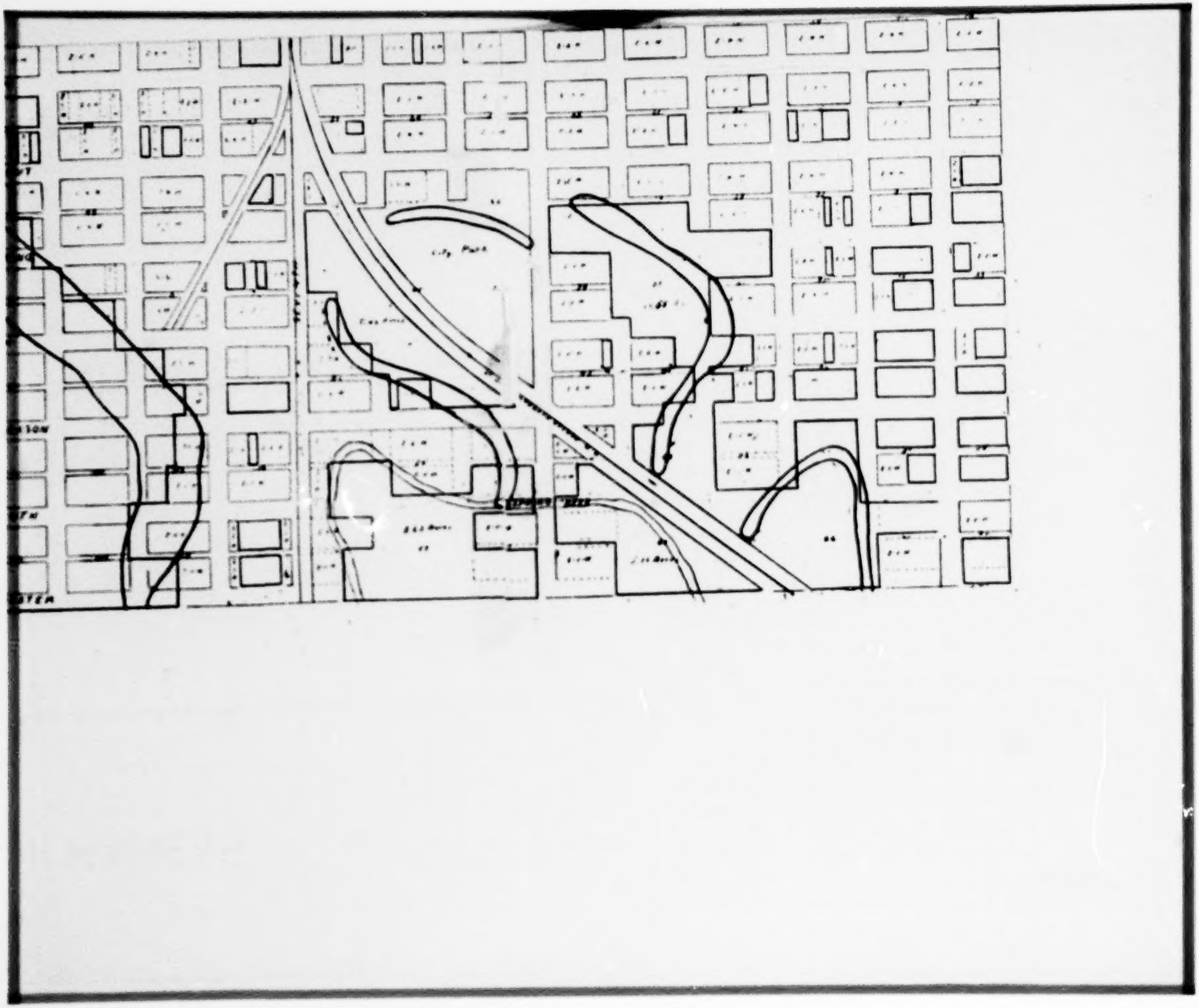



BIG BLUE RIVER
ELM
WALNUT
SPRING
OAK
JACKSON
SOUTH
HOLSTEIN



(to Marysville). From my own knowledge they have been there over three years, that applies to both. Witness had lived in Marshall County since 1917. The topography shows a little fall of the ground toward the South West away from the Railroad property; that on the Union Pacific Railroad right of way there are cinders or ballast on the side track. In block 71 (location of the Sinclair tanks) it is practically covered with cinders. That at the Sinclair property there is a sewer through the block; "right by there." (Sinclair property.) That the closest water main is diagonally across from the South East corner of the block. There is a water main immediately in front of the Standard Oil property, under the sidewalk west of the Standard Oil property, adjoining the property.

Witness had observed one oil tank on the surface of the ground on residence property in Block 11 Marysville, a distillate tank recently constructed of galvanized iron holding 150 gallons.

"It is right next to a building on that block." It is on the ground "a little above the surface." "Approximately about six feet from the building."

"There are a little over 600" automobiles in Marysville.

"Q. Can you give a description of the autos and the names of the owners of any autos having a tank with a capacity of more than five gallons?

"Mr. Bennett: We object as incompetent, irrelevant and immaterial, and not within the issues of this case.

"Mr. Colmery: And constituting no equity in the cause.

"Master: I will reserve my ruling.

"A. Mr. R. H. Hawkins has a Buick. • • • Ed McCloud owns a Buick.

"Mr. Doran: What is the capacity of the tank on a Buick?

"Mr. Bennett: We object as no proper foundation has been laid.

[fol. 106] "Master: Overruled.

"Mr. Bennett: Note our exception.

"A. P. J. Ring, a Buick, they are all residents of Marysville. D. H. Beaver, a Buick, E. D. Brauler, Hudson. Max

Rickard, Hudson. A. C. Pusch, Cadillac. W. W. Hutchinson, Peerless. Gordon Bin, Marmon. Mr. Hammer, a Nash. C. J. Belknap, Hudson. S. J. Carter, Cadillac. C. A. Travelute, Franklin. L. M. Cole, Dodge. L. M. Hall, Maxwell. Mr. Kirkpatrick, Dodge. E. G. Filbert, Ford.

"Q. Is that all you have?

"A. Yes.

"Q. State what if any of these gentlemen named hold any official position in the city?

"A. Mr. Travelute is the Mayor and the other gentlemen named just after him are members of the council.

"By Mr. Doran:

"Q. Are these autos kept in private garages over night?

"A. In private garages, some on their own premises. In the case of Ed Brauler and Gordon Bin they are kept in garages under the houses, the basement.

"Q. Can you state whether any of these tanks have a capacity of only five gallons or less?

"A. No, sir.

"Q. None of them do?

"A. No, sir.

"Q. Can you tell how many exceed ten gallons?

"A. All the large cars with the exception of the Ford.

"Q. Do you know approximately how many public garages are located in Marysville?

"Mr. Colmery: To which we object as incompetent, irrelevant and immaterial and not within the issues of the case and constituting no grounds for equitable relief.

"Master: Answer. I will reserve my decision.

"A. There are three main storage garages in Marysville.

"Q. Are you able to inform the Court approximately the number of cars stored there?

"A. The Independent garage will hold thirty. The garage of the Ford dealer will take care of over fifty.

"Q. Have you observed these garages as to whether they are filled with cars in the night?

"A. The Independent is almost always filled, and they stay there nearly all night.

"Q. And do they stay there in the daytime?
"A. Always a few during the daytime."

[fol. 107] Witness testified that no structures have been erected within three years near the Sinclair Company's property. Riepen's residence is 58 feet from the Sinclair tanks.

Exhibit "A" (made by witness) shows all houses and structures in the vicinity of the Sinclair Oil Company's tanks and the distance they are located from the Sinclair tanks. All shown on face of map; distance and location can be ascertained from an examination of the map and legends. Width of streets is 80 feet; all alleys 40 feet. (This is an error; map shows alleys 20 feet in width.) Lots are 44 x 132 feet, and blocks 254 feet long. (For exact measurements refer to maps and legends.)

Witness stated that Broadway is 100 feet in width. Outlying lots in certain blocks named by number in additions are off-size, which can be ascertained by taking the scale of the map. The vacant tracts are shown (on map) surrounded by red. The area is computed from the areas of the lots shown to be vacant; in the large vacant tracts it is computed. When the vacant tract is only one or two lots the area is not shown on the map.

Marysville was originally only a portion of the present townsite of Marysville. The present City of Marysville is a combination of the town of Marysville, the town of Palmetto and Ballard-Morrill Addition. The South West section of land shown on the map is the original townsite of Marysville. The boundaries of "old Marysville proper" was Center Street on the North, Eighth Street in the East, and all east of that and south of Center Street is Ballard and Morrill Addition to the original Marysville, which runs to the west boundary line and also to the south one. North of Center Street and from the west city limits to 16th Street and north to North Street was the town of Palmetto. That portion east of 16th Street as shown on the map, and north of North Street and later on the smaller additions—(were taken into the city.)

"Mr. Colmery: The defendants move to strike all of the testimony of the witness, Mr. Hayes, with reference to the

ownership of automobiles, the capacity of their tanks, the number of automobiles in the town, the number of garages, the capacity of the garages and the vacancy of tracts of land within the City of Marysville as being incompetent, irrelevant and immaterial, not within the issues in this cause, not constituting grounds in equity or for equitable relief against these defendants.

[fol. 108] "Master: The motion will be overruled at present.

"Mr. Colmery: The defendants except."

Cross-examination.

By Mr. Bennett:

There is no residence nearer the Standard Oil tanks than the coal chutes. I prepared this map last spring on request of counsel for the company (meaning plaintiffs). The coal chutes are nearer (the tanks) than the residence. Can scale the distance on the map. It is drawn to scale.

(Witness locates the Standard tanks on map by pointing.)

"By Mr. Bennett:

"Q. I notice in Block 51 you show here a place vacant. Is that accurate at the present time

"A. It was accurate last spring.

"Q. I will ask you if it isn't a fact that there is a residence being built west of the house designated as 99 feet away—It is our contention that this is a district developing. You don't know about those houses?

A. No."

Everything shown on the map surrounded by red is vacant. If the ownership of the house and two lots was one ownership it was marked improved. Vacant property is marked vacant because there is no house on it. When I made the map there was no building of any sort on the tracts shown on the map as vacant, or rather "Unimproved." The closest residence to the Sinclair tanks is 58 feet. There are some small frame sheds, private garages and outhouses, on the property line less than twenty feet away.

There are two other oil stations across the railroad tracks from the Sinclair tanks, on the Southeast corner of the block; the Derby Oil Company tanks approximately 65 feet away, and the Crow-Levick or Cities Service Company tanks. There is another set of coal chutes on the right of way of the railroad. The distance of the coal chutes is over sixty feet from the Sinclair tanks; can be scaled on the map. The map shows all buildings and residences on this property (Block 71). They are platted accurately. The Fenwick Oil Company has three tanks buried in Block 71.

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2. C. H. Wagner, a witness called by plaintiffs, testified as follows:

(Transcript of Testimony (Vol. 1, pp. 31-50)

[fols. 109-110] Direct examination.

By Mr. Evans:

I am manager of the Standard Oil Company branch, St. Joseph, Missouri. Have charge of all matters pertaining to sales. I have supervision over the territory in the northern part of Kansas and a portion of Missouri; Marysville, in Marshall County, is under my supervision. Am acquainted with the Standard Oil Company property in Marysville described in the Bill of Equity in this case. It consists of two bulk storage tanks, a warehouse, pump house, necessary pipe lines as well as necessary safety devices upon the tanks. Each tank is 10 x 16 feet, with capacity of 11 thousand gallons. The tanks rest on horizontal piers. The piers are built up 27 inches above the ground and 47 or 48 inches underground as a base for the tanks. They are placed on piers to make them accessible so that in case of leaks they can be easily repaired. The tanks are constructed of iron or steel. The shell is 3/16 inches thick, the ends 5/8 inches thick. On top of the tanks are McDonald vents, a device for permitting gases to escape off into the atmosphere. The McDonald vent is built in such way that it will function with very slight pressure. The valve is constructed so that the metal on top

of the valve is slightly larger than a dollar and any gas which would raise that vent would let it out. A few ounces pressure. It is a vent in common use everywhere in the oil business. I know of no better vent for that purpose. There is also on top of each tank a safety manhole vent, 18-3/4 inches in diameter. This is for the purpose of relieving pressure greater than can be taken care of by the smaller (McDonald) vent. It is held in position with a frame about 22 or 23 inches in diameter. It acts very much the same as the valve on an auto. It will discharge the gases in the tank if there is pressure enough to lift this up. It will go up and make an opening about four inches high. The McDonald vent is at one end of the tank and the manhole at the other or in the middle.

Witness is shown Exhibit "B," two pictures of McDonald Duplex Oil Tank valve.

(Here follows Exhibit B, marked side folio pages 111 and 112)

[fol. 113] The Standard Oil Company's tanks at Marysville were there, to witness' own knowledge, one year, and letters, records and cor-espondence in the St. Joseph office, under witness' supervision, show that tanks were there since September, 1896. The tanks now there are the tanks originally installed.

Over objection of defendants that evidence is incompetent, irrelevant and immaterial, overruled by the Master and excepted to, witness testified that the Standard Oil Company did a business there (in 1923) amounting to $10,797.27, and the year before (1922) of $20,402.31. The two years represent a fair average of the business transacted at that station per annum.

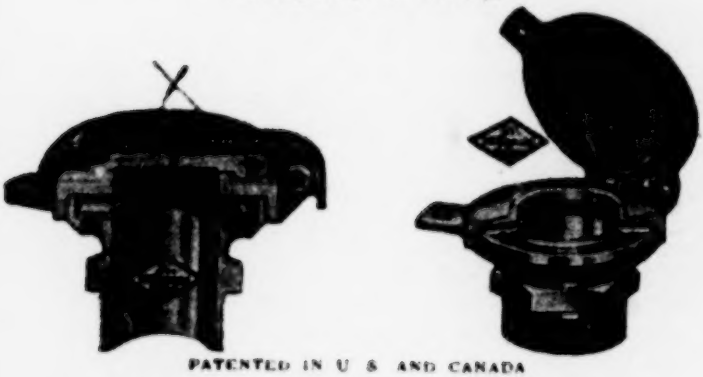
Gasoline and kerosene (coal oil) are put in the tanks through pipe lines connected with tank cars on the side track of the railroad. The tank car is practically the same as the storage tank, except it is on wheels. The capacity of the tank car is from six to twelve thousand gallons. Stock is always delivered to Marysville in tank cars. The gasoline and kerosene (coal oil) are transferred from tank cars into storage tanks through an overhead loading device from the dome of the tank car by gasoline engine pump.

PLAINTIFFS EXHIBIT B 111-112

A Y McDONALD MFG CO

Duplex Oil Tank Valve

Threaded for 2 inch Iron Pipe



PATENTED IN U S AND CANADA

Supplying air to the tank through slotted openings under the aluminum valve "A" when oil is drawn off

Permits expulsion of air or gases through hinged valve "B" when pumping oil into the tank.

Prevents internal pressure due to expansion by permitting air and gases to pass out through valve "B."

Valves "A" and "B" on ground seats are air tight, hence losses by evaporation are prevented or at least greatly lessened

Throw back iron cap "C" and valve "B" giving full 2 inch circular opening into tank to insert gauging rod when taking stock of contents of tank.

Iron Cap and Valve automatically drop back into place and seal the tank when gauging rod is withdrawn.

Iron Cap housing entire upper part of body protects valve and hinged parts from snow, ice, etc., so they cannot clog or interfere with the work of the valve.

Iron Cap hinged by lock nut bolt to prevent working loose.

Hinged joint on valve "B" and iron cap "C" are loose fit to prevent binding

*Use 2 inch nipple and pipe coupling to connect valve to tank so as to raise valve 8 to 12 inches above the tank so that snow will not bank up around valve and seal it.

†Lock the valve by means of a padlock through holes in lugs to prevent tampering with valve and also to prevent syphoning oil out of tank by strangers

Lugs stop falling iron cap to prevent strain on hinged joint.

Price ..... each $7.00

*Extra for Nipple and Coupling ..... each $ .50
†Extra for Brass Padlock and 2 Keys ..... each .50

Stock enters the storage tank from underneath. The company tries to unload the stock the day the cars arrive. This cannot always be done, in which case the tank cars are held on the "spot" alongside of the storage tank. They are sometimes permitted to remain in the yards there.

Storage tanks on piers are subject to supervision first by the agent responsible for the station. Then the territory salesman directly responsible for the agent. Then the accounting department frequently makes inspections of the plant. Tanks are subject to supervision and inspection by the construction superintendent. These men all frequently visit these stations and make inspections of the plant and general condition of the storage. In each instance every one of these men who visits the storage station must inquire about leaks as leaks "are our great hazard." Leaks would be the thing that would cause trouble; fire from sparks or a match thrown down. Leaks have more to do with fire hazard than anything else. The moment a moist spot shows up on the tank we repair that place. A wet spot appearing on the tank enables the discovery of the weak spot. Tanks are repaired without re-[fol. 114] moving the contents. If moist spots are not repaired they get larger and the tank leaks there. To prevent leaks the men in the sales department constantly supervise the tanks and equipment, as do also the construction department men. These are the men who put in the pipe lines and build stations. They inspect the tanks. We had a real boiler-maker in our territory practically all this year. The other construction men are told how to take care of these leaks. The tanks are frequently painted to keep away corrosion which starts leaks. We try to paint them at least once a year to prevent leakage and corrosion which causes leaks. The tanks are occasionally cleaned out for the reason that in transporting gasoline in tank cars we get a small amount of moisture and there is some precipitation in the tank, and we take it from the tank through a pitcher pump. Moisture in gasoline causes boiling and of course it is not good for automobiles. It is necessary where we have very unusual conditions to send a man in the tank. We don't like to do that, they may be overcome by gases. When men are sent into the tanks they must go down equipped with an oxygen helmet. We

air the tanks when we put a man in. This is done by disconnecting the pipe below and opening the manhole to get a circulation of air. This is deemed necessary to make repairs on the inside that we can't get from the outside. The tanks are sometimes steamed. They are usually cleaned out twice a year. This is deemed necessary for the safe conduct of the business. At a station where there is considerable business the tank content is measured every day. Where a smaller busines- is done, two or three times a week. There is another safety device, the grounding device. We equip everything in which it is possible to develop static electricity; we connect together to dissipate the static electricity and ground it all. That is a safety measure.

There are 198 above ground storage tanks used in the territory under supervision of witness, and no underground tanks.

This testimony was objected to by counsel for defendants as attempting to establish custom which defendants claim constitutes no ground of relief.

Overruled and excepted to.

The unloading device is an overhead arrangement, permitting placing of a pipe into the tank car to draw gasoline into the storage tanks. There is also the same arrangement to discharge gasoline from storage tanks into the tank trucks.

[fol. 115] "We have done away entirely with the underneath method of unloading."

Most tank cars have an opening underneath, but it is not used by the Standard company. The Standard storage tanks at Marysville carry gasoline and kerosene only. The practice of unloading tank cars from the bottom was abandoned as the company thought it dangerous for the reason that the car coupled up with the unloading device might be hit by a switch engine backing into it and break the pipe and it would result in a terrible leak. The company tries to avoid leaks. There is no chance for a leak in unloading from the top.

Cross-examination.

By Mr. Colmery:

Witness has been in the employ of the Standard Oil Company ten years. Prior to present position was Assistant Manager at Grand Rapids, Mich. Has been here one year.

We call the McDonald Safety Vent a standardized equipment. It is generally used by the Standard Oil Company. It is one of the equipments used on each of the company's tanks in the City of Marysville. The man-hole vent is 18-¾ inches in diameter and allows a lift of practically four inches up. The piers at Marysville are 27 inches above ground and 48 inches underground. They are to enable the company to get at leaks. The equipment and construction gangs come and make inspections to take care of and protect against leaks, and take care of the rest of the equipment.

The reason for abandonment of underneath unloading of tank cars in favor of overhead unloading was because of leaks and because of the hazard which arises from gasoline leakage from vessels in which it is stored. Moisture spots tend to increase leakage if not taken care of. This is due to the vibration of the ground from passing of railroad engines. This would cause a drip and would occur as well at the end of the tank as at the seam, at the edges. Leaks are regarded as very dangerous for the reason that any sort of spark or hot cinder or match or cigar might ignite it. The McDonald safety vent and man-hole cover is to allow the escape of the gases. Vapor arising from gasoline and kerosene will ignite if it is mixed properly with air. Gasoline will also ignite if properly mixed with air. The point of ignition in gasoline motors is 17 to 1, carburetor mixture. The gasoline pump used for power to empty tank cars and fill storage tanks is located between the tanks and the warehouse, (referring to map). Grease and lubricating oils are kept in the warehouse, in [fol. 116] less than carload lots. It is approximately 20 feet from the gasoline pumping station to the tank in Marysville. There are driveways to furnish egress to the tank wagons. They come in Walnut Street. There is a sort of platform with pipes going over it to fit into the tank wagons and load them. The tank wagons are loaded

from the storage tanks right at the warehouse. Pipes run from the storage tanks into the warehouse. There is a shed there where the wagons stand while being loaded. One tank wagon is loaded at a time. There is room under there for only on wagon. The warehouse is just one room. It is frame; think it has a shingle roof.

Witness does not know when the tanks at Marysville were last cleaned out or painted. The grounding device is to dissipate lightning or anything in the nature of static electricity which constitutes a hazard of fire. The hazard of underneath loading of tank cars is leakage which if exposed to proper spark would cause fire. Gasoline if ignited will catch fire to anything combustible around it. Witnes- recalls fires that have occurred close to storage tanks, in fact next to the storage tank, in which there was no fire in the tank, no explosion in the tank, although the tank became very hot. I have in mind one at Greenleaf, Kansas, where the warehouse burned which was right close to the tank, burned completely down. The gases were dissipated into the air through the vents. I read a report of it. The warehouse burned up. Fire was caused by explosion of gasoline from a tank wagon. It ignited from the motor of the truck.

Barrels of lubricating oil generally blow up in fire. They blew up at Greenleaf. The barrels in which lubricating oil was stored are steel. I presume they separated at the weakest spot. They have no vents in them. Containers of lubricating oil if you apply enough heat will separate. The same as a steam boiler will blow up. It would have to be vapor to ignite by spark from motor. Gasoline will not ignite unless it is properly mixed with air. The spark from a gasoline motor in close proximity to vapor coming off gasoline will ignite it. The storage tanks at Greenleaf were horizontal tanks. They were equipped with McDonald vent and manhole safety vent, regular style, the same as at Marysville. The manhole cover did not blow off at Greenleaf to witness' knowledge. In the case of a manhole cover or a McDonald vent there is nothing could stick. There is only a little hinge that opens and closes and even the very smallest opening will relieve pressure. We have water tight covers over the top of it and the hinges do not [fols. 117 & 118] corrode or stick. It is a water tight cover,

PLAINTIFFS EXHIBIT C 119-120

a galvanized top on the manhole. Something like a lid to a garbage can except there is room for play under it.

Redirect examination.

By Mr. Evans:

The cap of a manhole vent is so built that it rises with pressure. It fits over the plate that rises with pressure.

Plaintiff offers in evidence Exhibit C, a picture of a manhole vent.

(Here follows Exhibit C, marked side folio pages 119 and 120)

[fol. 121] Referring to and explaining Exhibit C, witness stated:

"This is the galvanized protector cap and inside that is the mechanism that raises and lowers. This little valve is the McDonald valve. This is the weather tight cover over the manhole and that works with a hinge and this cap and this cover here is merely to keep the water from getting into the tank."

If you could put a lighted match in contact with liquid gasoline, without putting it in the vapor, it would not catch fire.

The explosion of barrels containing lubricating oil is not caused from ignition but from expansion, such as one would have if the content were water. The same thing.

The canopy under which the tank wagons are filled is simply a canopy to keep the weather off or the rain. There are no sides or ends to it. They drive right under. The tank wagons at Marysville are not loaded inside, they are always loaded outside. This is to permit the free operation of the truck and permit the dissipation of the gases that might gather into the air.

Recross-examination.

By Mr. Colmery:

The galvanized manhole top or cover which fits over the top has inside a valve which is permitted to go up and down

with pressure. Vapor escapes down the sides under the top. This is all open. The pressure valve is in the form of a U. The pressure comes up to the top of the valve and down to the bottom of the manhole cover, then to the top of the manhole cover and out. The top is the weather cover. From the picture it looks as though the cap fitted rather tightly. They lock the whole mechanism.

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3. Roy Cross, a witness called by plaintiffs, testified as follows:

(Transcript of Testimony, pp. 50-78)

Direct examination.

By Mr. Doran:

My name is Roy Cross; I live in Kansas City, Missouri; I am a chemist, graduate of the University of Kansas and of Tulane University at New Orleans; graduated from the University of Kansas in 1905 and from Tulane in 1911; have been continuously since graduation in the practice of chemistry and kindred subjects. For practically twenty years. I operate the Kansas City Testing Laboratory, a corporation of Missouri, located in Kansas City, Missouri. I am general manager of the concern. Its business consists of [fol. 122] an analysis and testing materials, designing plants and building oil refineries and kindred work. My education and practice has brought me in contact with the hazards that may arise from the maintenance and operation of gasoline and kerosene tanks above ground. I have been concerned in the designing and building of refineries for the manufacture and storage of gasoline, about 100 refineries altogether, located in the territory of Kansas and many other fields in this country and abroad.

"Q. Now, from your experience in studying and practically applying knowledge to the comparative hazards that may accrue from the maintenance and operation of tanks for storing gasoline and kerosene above and beneath the ground, have you an opinion as to whether it is safer to maintain and operate tanks above ground or underneath the ground?

"A. Yes.

"Q. State what that opinion is?

"Mr. Bennett: We object as no proper foundation having been laid calling for a comparison.

"Master: Overruled.

"Mr. Bennett: Note the defendants' exception.

"Q. You may answer, which is the safer?

"A. From the standpoint of both the manufacturer and the public an underground tank is the safer for storing gasoline.

"Q. Now, will you be good enough to explain to the Master the different elements of danger or hazards of danger which may occur from maintaining storage tanks underneath ground as compared with the hazards that may arise from maintaining or operating tanks of the same capacity above ground?

"A. That statement particularly applies to large capacity. In case of tanks of small capacity—tanks of 5,000 gallons or upward the larger tanks.

"Q. State the reasons for that?

"A. A small tank can be placed in the ground as one piece, taken in and out of the ground as one piece without any particular strain upon it. It can be so thick and strong there is no danger of leakage; in case of a larger tank leaks will almost certainly develop from the expansion and contraction and from the ingress of water. From the standpoint of the manufacturer or the operator, a person who maintains a large tank, the first difficulty is construction, [fol. 123] then the development of leaks, which invariably occur, these leaks cannot be properly repaired without taking the tanks out of the ground and all in all the maintenance is practically impossible. From the standpoint of the public at large any leakages are never allowed to evaporate, there is no means of removing anything in the ground and it usually goes into some watercourse or basement. It contaminates drinking water and goes into basements and causes explosions and goes to a much greater distance than it could possibly go on the surface of the ground.

"Q. You mentioned some of the difficulties of buried storage. Now is there any difficulty about flooding of the tanks. What effect does the flooding have upon the tanks?

"A. A tank filled with oil if water gets around it the water lifts it out of the ground. If there is a leakage point the water gets into the tank. If there is a fire and the firemen throw water on the tank or into the tank, it throws the oil out.

"Q. Have you had experience in observing the effect of gasoline getting into the sewers and the elements of hazard that arise therefrom?

"A. Gasoline is unquestionably the cause of a great many sewer explosions.

"Q. You may explain how that might occur, where the leak occurred in the ground from an underground or buried gasoline or kerosene tank?

"A. The gasoline would flow into a sewer and the water causes more or less evaporation and the passing of a spark such as throwing a cigar into a sewer and that would cause an explosion. Or it would leak into a trap in the basement and out into the sewer or it may work in the trap into the trap and basement and cause explosions there.

"Q. Might that result in an explosion?

"A. Yes.

"Q. And the blowing up of houses might occur. In a condition where a company maintains a couple of tanks each of ten or twelve thousand gallons and there is a sewer within a short distance, fifty or seventy-five feet of that set of tanks, if they are buried under-ground, might there be a probability or possibility that there might be a leak, taking the vapors and fluid into the sewer and cause an explosion?

"A. Yes, sir.

"Q. What are the elements that might induce leakage in buried tanks?

"A. Corrosion is far greater underground than above ground.

"Q. Why?

"A. The ground is almost always moist and there is oxygen in the water that runs around it and that would cause corrosion.

[fol. 124] "Q. Would there be more difficulty in reaching the tank to repair it?

"A. Yes.

"Q. What about the ease and facility of making repairs upon tanks maintained above ground as compared with those underground?

"A. Above ground storage is easier to repair.

"Q. In your explanation—I mean your experience in constructing and designing oil stations and refineries do you know of any of them that are—that have tanks buried underground?

"A. We have never designed or approved any underground tanks but I know of a few.

"Q. Where were they?

"A. There is one at Newkirk, Oklahoma, and one at Muskogee, Oklahoma.

"Q. Do you know anything about the causes that led to that kind of storage?

"A. I believe it was promoted by a man who wanted to build concrete tanks.

"Q. Do you know what the result of that was—do you know about this personally, is your knowledge of it personal?

"A. I only know what I gathered generally by being present at the refinery.

"Q. Do you know whether that was continued or what was done with it?

"Mr. Bennett: I think he has shown that this is hearsay.

"A. In one instance it has been discontinued.

"Q. Do you know the reason why it was discontinued?

"A. It wasn't satisfactory.

"Q. Do you know it wasn't satisfactory, if you know?

"A. Yes.

"Q. State.

"A. Because of leakage in the tank."

The comparative flash explosive characteristics of gasoline and crude oil are practically the same. Both fluids will flash at ordinary room temperature. That is, if both are put on the floor they will take fire with equal facility. There is no rule of chemistry or any other rule that would justify classifying crude oil in a different class from gasoline on account of the public safety. It is generally recognized that crude oil is in the same category from the

safety standpoint. In fact, it is common to classify all substances in the nature of gasoline under the general classification of flash point less than 80 degrees.

[fol. 125] Over the objection of counsel for defendants, that the testimony was usurping the province of the court, overruled and excepted to, the witness testified:

"Q. Do you have an opinion whether there is any element in these different products which would justify a different classification of the products?

"A. The crude oil and gasoline having the same flash point and same inflammable point should be put in the same classification.

"Q. In other words, I wish to ask you, Doctor, whether there is any difference in the comparative hazards of maintaining these different products, that is gasoline and crude oil, below and above ground. Is there any difference in hazard?

"A. There is not."

If the tanks are buried underground there is a likelihood of failure from expansion and contraction. This might be brought about by the settling of the earth, the changing of temperature as cold oil is put into the tank in the winter, by the ingress of water about the tank. If cold gasoline or coal oil were pumped into an underground tank in the winter the tank would be comparatively warm and the gasoline cold, and there would be a very rapid contraction, and corroded places (in the tanks) would open up and cause leakage. Electrolysis causes very rapid corrosion. If the tanks are buried underground electrolysis might result in corrosion and leaks. Where there are leaks from underground tanks there is danger of permeation of the earth by fluids or gases. Cinders invariably contain sulphuric compound and that forms sulphuric acid and that attacks iron underground, resulting in corrosion and leakage.

"Mr. Evans: Just one thing. I think the Doctor misunderstood your first question about his opinion of underground and aboveground storage. Just read the question and the Doctor's answer.

(Question read, and answer of the witness read.)

"Now, you heard that question read and the answer in the first part of my inquiry as to what your opinion was as

to the relative hazard of maintaining and keeping the products mentioned in tanks maintained and operated above ground as compared with the storage underground. *You answered that the underground tank was safer. Was that what you wanted to say?*

[fol. 126] "A. *No, I didn't. The overhead tank, the above-ground tank is the safer.*

"Q. *And the underground tank has more hazards than the above ground tank?*"

A. *Yes.*

"Q. *That is what—the way you wish it to stand?*

A. *Yes.*"

(Underscoring is plaintiffs'.)

Cross-examination.

By Mr. Bennett:

I am familiar with some of the regulations of the National Board of Fire Underwriters and the National Fire protection Association. If they issue a bulletin stating "The hazards of such systems depends upon the distance from burnable property and topography of the surrounding land, but owing to the tanks being above ground they are considered as more hazardous than underground systems of storage," I would not agree with it. I do not know all the circumstances. "As a general proposition I would say they were wrong."

Five thousand gallon tanks are fairly large tanks. I don't say that it would be impossible to get a tank of 10,000 gallons capacity into the ground without breaking the seams. The possibility of breakage is very much greater on a tank of that size. This is generally recognized by the industry.

The nature of the soil, the topography of the ground, might make some difference, not much. It (leakage) might lead directly to basements and other places. If the particular grounds owned by plaintiffs were so situated that it would be impossible for seepage to get into watercourses and sewers the objection would be removed. If they do leak it doesn't make any difference. If there is water outside the pressure is from the outside in, and if it is dry out-

side the pressure is out. If there is a whole in the tank as big as your hat you could see it (the oil or kerosene) come out.

"Q. And steps could be taken—you could take steps——
"A. I would take the tank up and put it above ground."

If there was no water around the tank, the gasoline would probably go out in the ground and follow the top of the ground water. It would run in a stream if there was a sufficient opening in the tank and in the ground to maintain a stream. There is always a ground water level. If this ground water level at Marysville were above the top of [fol. 127] the tank I would say it was a dangerous thing. If it were below the tank it would be a little safer.

Gasoline and crude oil explode at the same point. One is just as dangerous as the other and as apt to catch fire. Crude oil is refined because people don't like to burn black gasoline; there is a lot of stuff in it. If you pour crude oil on the floor and throw a match into it it would catch fire. "There isn't any question about it." Gasoline is the lighter constituents of crude oil, the more volatile fractions. Gasoline is the higher content, of those lighter fractions. There are some conditions under which a low content (of gasoline) would be more dangerous than a high. It is equally dangerous to keep crude oil and gasoline.

It would be better to use limestone chat around storage stations than cinders, which create sulphuric acid.

The flash point of crude oil and gasoline is approximately the same. We (The I. C. C. Tank Car Co.) usually classify anything with a flash point under 80 degrees as dangerous. There are many classifications of a produce—benzine, benzol, ether, gasoline and naphtha give off volatile gases. They might have classified crude oil with them. It is not less dangerous. "Distillate is less inflammable." The inhabitants of Marysville might have crude oil for fuel oil; it is used to some extent for fuel oil. Distillate in quantities of 500 gallons is dangerous above ground but it doesn't flash below 80 degrees, but crude oil does catch fire. Distillate is commonly burned in furnaces.

I know about the geological structure at Marysville; it is unquestionably stratified limestone; don't know what is

in Block 71. There are certain qualities of soil common to all soils.

A 10,000 gallon tank sitting out in the middle of the residence district is hazardous. I have no knowledge of explosions in above ground bulk storage tanks such as the Sinclair and Standard have. Gasoline will explode under the right conditions. "Gasoline unfortunately burns sometimes when you don't want it to."

A considerable amount of my professional work is oil work. I am employed by the Kansas Testing Laboratories. I expect to send a bill (to plaintiffs) for my services. My services will be $50.00 a day to state the facts as I know them.

[fol. 128] I would place crude oil in Class One as defined by the National Board of Fire Underwriters in the proposed ordinance and distillate in Class Three. I think that the recommendation of the National Board of Fire Underwriters that storage of inflammable liquids shall be outside of buildings in underground tanks and above ground tanks, except that storage in tanks above ground and outside of buildings is prohibited in mercantile or other congested districts, and land near streams or other waterways which would carry burning liquid into congested districts, refers to small containers. It is an extremely dangerous thing to set five gallons in a building, and it should be buried in the ground to get the most safety. I think all of that applies to small containers. (Referring to the Fire Underwriters regulations.) I have had experience with storage tanks above ground. They frequently leak. Leaks can be arrested and repaired before they become serious. If the pipes connected with the storage tanks should melt off and a stream of gasoline run out it would be dangerous. You don't know where leaking gasoline is going when the tank is underground; above ground you can see the leak and stop it. It can be taken care of immediately. Leakage amounting to a gallon from an underground tank could run into a sewer and be dangerous. The temperature of underground tanks could change in filling easily as much as 40 or 50 degrees; after the tank is once filled the rate of change would be very slow. The maximum temperature of an underground tank, buried three feet underground, in

the hot summer would not exceed 80 degrees when filled. The ground temperature towards the surface varies from 100 degrees to 50 degrees. The sun would have very little effect on a buried tank. It would warm up in a tank above ground if not insulated. Would expand the gasoline and make a greater amount of vapor in the tank and increase the volume of gasoline. Some of the vapors pass out through the vent which doesn't allow any pressure on the shell to speak of. There is some loss of gasoline in passing off of vapors. Not enough loss to impair its efficiency. If gasoline is kept underground there is less evaporation. The temperature of gasoline in an underground tank in winter would be a little less than in summer. It would be about sixty degrees. It is very difficult to get a good test measurement of the content of an underground tank. There might be a discrepancy of 100 gallons in a 10,000 gallon tank and you could not detect it. A horizontal tank in an inch up and down would contain from one to two [fol. 129] gallons in one part, twenty to thirty gallons in another, depending on whether it is on the very top or in the center. An inch in the center would represent more than an inch at the top. The trouble in measuring is the ability to put a stick in a tank and pull it out straight. A serious leak in an underground tank could not be detected. It could leak enough to seep half way of a 132 foot lot and get into a sewer and cause an explosion and yet not be detected. It commonly would leak that much and not be detected. A five gallon leak might pass through 66 feet of earth, get into a sewer and cause an explosion, following surface water in wet ground. The ground could be wet and yet not hold the gasoline back. Two or three hundred gallons of water around an underground tank—10,000 gallon capacity—might float it out. A full tank is less likely to float than a tank half full. If the water got considerably above the gasoline it would float out if not anchored. Three feet of earth would not prevent such a tank from floating out. The tank would have to be strapped to the foundation. It could be fixed so that the hazard of floating out would be minimized. It could be tiled and drained into the sewer or into some sort of a drainage channel. If carried off into the earth that would minimize the danger of the tank floating. It depends upon the topography of the ground. For this I

have assumed the best possible conditions suitable for underground storage over 5,000 or 10,000 gallons. Filling station tanks have a capacity of from 500 to 1,000 gallons. They could be constructed of heavy material. I don't think you could get enough material to safeguard as large tanks as these (at Marysville). Most of the tanks I design are for refineries, 10,000 gallons or more. I have had experience with small tanks; there are a lot of small tanks around refineries. I don't know of any tanks of 5,000 or 10,000 gallon capacity designed and recommended for underground use.

Redirect examination.

By Mr. Doran:

If there were a leak in a 12,000 gallon underground tank which was constant but not discovered the ground would become saturated with gasoline which would penetrate for a great distance. If there were such conditions vapors would arise from the saturated earth which might penetrate into sewers or cellars and thereby create a menace.

There is gasoline in crude oils; gasoline is obtained from crude oil. Natural gas springs from crude oil. Crude oil [fol. 130] is practically always saturated with natural gas. The danger from them would first come from crude oil, next gasoline, next kerosene. I have known of cases where gasoline had penetrated some distance in the earth in the breaking or leaking of (tank) cars. The case I speak of was kerosene. The kerosene seeped through the ground several thousand feet into a well. I think this was at Colby, Nebraska.

If the tanks were buried in compliance with the ordinance involved in this case, it would be necessary to clean them out once in a while. This would be a very unsafe proceeding because of the difficulty in venting and emptying. There would be difficulty in cleaning out the fumes, vapor and gases, so a man could go in. It would be more difficult to clean them out than tanks above ground.

I have seen tanks thrown out of the ground by water. This was at the Kansas City Refinery.

The McDonald vent is for the breathing of the tank, passing back and forth of the vapors and air so it won't cause a collapse of the tank. The McDonald vent is provided with a screen for the purpose of preventing any fire from jumping back into the vapor space of the tank. The mixture coming out of the vent will burn, but if fire was placed at the vent it would get no further than the screen. It operates the same as a miner's lamp in a mine. A McDonald vent operated properly would be sufficient under all conditions to take care of a tank 18 x 10½ feet and keep it from exploding. This could be done without any other vent and a manhole vent would be an additional assurance of safety.

Recross-examination.

By Mr. Bennett:

I do not remember who told me about the car of kerosene in Colby, Nebraska, but I do remember that the man who owns the well thought he had an oil well. We took samples and found it was kerosene. Then our investigation showed that there was a tank (leaking). I analyzed the sample. Based on facts given me I would say that the kerosene ran under the ground.

The McDonald vent is designed to take care of a tank of the size indicated. When operating under normal conditions it will be satisfactory. It would do this if it were not stopped up.

A dike around a 10,000 gallon capacity tank would be proper construction.

[fol. 131] "Q. And if it is a fact that the tanks maintained and operated by the two plaintiffs in this case are not diked then they are not equipped with the most modern safeguards for fires?

"Mr. Doran: The Sinclair Company objects to that because it is not within the issues—there is no demand——

"The Master: Overruled.

"Mr. Doran: Exception.

"A. Diking would undoubtedly be an additional safeguard.

. . . . . .

"Q. Do you consider that as a necessary safeguard?

"Mr. Doran: Same objection.
"The Master: Overruled.
"Mr. Doran: Except.

"A. I consider it an important safeguard."

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4. A. J. Brooks, a witness called by plaintiffs, testified as follows:

(Transcript of Testimony, pp. 78-90)

Direct examination.

By Mr. Evans:

My name is A. J. Brooks; residence St. Joseph, Missouri; occupation, construction and supervision superintendent for the Standard Oil Company, of Indiana. I have charge of all buildings, installation of pipes, lines and pumping equipment. The property is under my supervision. Have been with the Standard Oil Company in that capacity since April 1916. Marysville, Kansas, is in my jurisdiction. I am familiar with the company's property and its surroundings, including the general lay of the ground, from observation and inspection. I have been going there between eight and nine years.

The improvements near the Standard Oil Company plant during that time—just an ordinary frame residence now under construction, it may turn out to be stucco outside, but the frame is up there and there have been some minor changes on some old coal houses and I don't know but what they have rebuilt an old section house. To my knowledge there are no other changes. There could be some minor [fol. 132] changes, but not anything of any importance within the immediate vicinity of the plant. I think they remodeled a little residence about 105 feet on the west of our plant, two or three years ago. I seen some carpenters there. They commenced the erection of the new residence I speak of about three or four weeks ago. The house is just about under cover.

The Standard Oil plant there is on the right of way of the Union Pacific Railway Company tracks.

The piers of the plant are 27 inches under normal grade. From time to time I have put in dirt and raised the grade to keep even with the railroad company as they raise their tracks, straighten them and bring them out of the ground. I have filled in until I have a grade about ten inches. I have hauled in and the railroad company has hauled car after car of cinders, and we put in gravel; the railroad company put in Sherman Hill gravel.

On the west they unloaded coal, two or three carloads a day. They have built up there, thrown in cinders and coal dust and made a driveway.

Over the objection and exception of the defendants, witness testified that it would cost the Standard Company $3,700.00 to put in the plant there. The Company has several men who inspect the plant—in my department—the construction department—that take care of the pumping equipment, the pipe lines, the overhead unloading rack and pier foundations and the tanks proper, that is our equipment to look for leaks and weak places. They make close inspection of the tanks and pipe lines first for cinders, we find that is our greatest enemy. In some manner they cause corrosion faster and of course that rots our rivets and then constant vibration, caused by heavy loaded cars moving, causes the joints of tanks and pipe lines to wave. The company has to keep the lines clear to keep away this corrosion. Where corrosion is found, portions of the pipe lines are taken off, the tank and rivets are caulked up, and paint is kept on the tanks, to prevent corrosion. The most noticeable indication of leaks is a sweat; sweat spreads out on the outside of your tank, just a damp spot. If allowed to remain in time it will cause a leak that will run down the tank and drop off. When discovered we immediately caulk that tank, scrape it off and caulk it up to prevent a leak. [fol. 133] I have men in that vicinity all the time. There are numerous stations. I have ninety stations. I have six or seven men in Kansas on those ninety stations all the time. They are through Marysville, Kansas once a week. They may not have over five minutes there but they have to be there. If there are no leaks, the next time they are there

they look at it again for leaks. The tanks are put on piers so that we can see under them. We are now putting them up 7 feet in the air so that we can not get to them, to enable the inspectors to discover and the workmen to stop leaks.

The minute a car of gasoline leaves the refinery it sweats. All pipe lines sweat. There may be only a few drops of water but that settles in the bottom of the container, in the bottom of the storage tanks. We provide two inches free. The outlet is above that. Accumulation in there causes rust next to the seams. You might say that the seam of the tank is not any more than a razor edge. It is turned over against the shell, the rivet is the strength. The riveter turns that edge against the shell and makes it tight. If the tank gives more trouble than usual we put in a new one, seven feet above the ground.

First the salesman makes an inspection. We have a litmus paper which has a liquid coating. It is put in the tank and if there is water there it will turn it white. If there is over half an inch in the tank they write for us to clean the tanks at Marysville. We will send out a pump and the agent or the salesman or the construction department or the first man through that station, they all function in that department—they absolutely clean those tanks. If they need cleaning I send a man out with a safety first trunk, a rope ladder and revolving fan and a big safety rope. We pull in a tank car out of the first train that goes by, pump the contents of the tank into the tank car, take off the pipes down at the manhole and let it stay open all night to ventilate. It is the only way you can do. We go there next morning and take a big piece of cardboard and make a big cone and put it in here and put the fan on it and it forced the gases out. Then we get our gas mask, you could not go down there without it, couldn't survive in there—either by steaming or putting water in or any other method, even by letting that tank stand four or five months. You have to do it by ventilation and I don't mean just top ventilation. You have to clean it out or junk the tank,—sell it or give it away if you can. A man ought to go down once a year. Those tanks have to be pumped out twice a year. Pumping out is not a big process. We probably [fol. 134] average pumping them out once a year and get-

ting right down in and cleaning them out once a year. We do what is necessary, absolutely.

Those tanks weight from 3½ to 7 tons; they hold from 207 to 345 barrels; they rest on three piers. If the tanks corrode inside over the piers the shell would sink over the piers. In such case we put in new tanks. When you get a leak the gasoline gathers in pockets. Over in Chulo, Missouri we had a tank on the wrong side of the railroad and we had to move it. There were two very old tanks at the old location that had been leaking. We had to place the unloading pipes underneath the railroad tracks. In digging for that line I started at the old site; the men struck yellow clay in the middle of the tracks. They called me down there and I found that gasoline had worked through the sub-soil and pocketed on top of that clay, and we had to dip it out with a basin. That was 150 feet from the old plant. That tank was not on piers, it was on the ground. Leaks occurred in the seam along the bottom. One walking around the tank could not see it (the leak) at all. The main purpose of inspection is to discover and repair leaks and that is what my department does.

I believe from observations made, and inspections, that the life of above ground tanks is 25 years.

Over objection and exception by the defendants, witness testified that he did not believe storage tanks underground would last ten years.

"I can't see how it would last that long, because I believe that there are elements that would eat it up * * *. Corrosion would eat it up."

The minerals under ground induce more corrosion than would occur above ground. Our tanks are always on a railroad and minerals are piled along there,—Coal, coal dust and cinders. The cinders would be the worst. "I have replaced pipe lines that have been eaten clear up." Corrosion or rust does it. Water running through the cinders makes it worse than other (minerals). It is my opinion that vibration would be much greater underground than above ground.

Cross-examination.

By Mr. Bennett:

Witness was unable to say when the tanks at Marysville were entered and scraped out, or when they were last

pumped out; that is a matter of record. The clerks keep the records.

[fol. 135] The Standard Oil Company has no bulk station tanks buried. We couldn't bury tanks at Marysville for less than $3,700.00; that is a reasonable estimate.

Gasoline will pocket in yellow clay. The tanks at Chulo, Missouri, were sitting on a bank of soft loam. We put our tanks about seven feet high so as to get at them better to inspect and repair and paint them. The aim of our department is to prevent leaks. The prevention of leaks is a matter of safety, absolutely. A leak is dangerous because it will drop constantly. It would go into a pocket—lead to a pocket. It would naturally lead to fire. In such case everything burnable would burn. Tanks do not burn readily.

My territory goes west to the Colorado line on the Missouri Pacific Central Branch, two tiers of counties "north" of Hays.

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5. H. R. Boehmer, a witness called by plaintiffs, testified as follows:

(Transcript of Testimony, pp. 91-107)

Direct examination.

By Mr. Evans:

My name is H. R. Boehmer; I live at Sugar Creek, Missouri; superintendent of the refineries of the Standard Oil Company of Indiana there. My duties consist in supervising the operation of the refineries and maintaining the equipment in first class condition. The capacity of the refineries is 1200 barrels of crude oil daily.

I graduated from the University of Wisconsin in chemistry and physics. I have had chemical engineering.

Have had occasion to store gasoline and other petroleum products at Sugar Creek. We have there about 35 or 40 million gallons available. In the spring the storage capacity is full. The storage is in tanks above ground. Have studied the methods proposed for storing petroleum products.

Over the objection and exception of the defendants, witness stated that it is his belief that underground tank storage of petroleum products presents a greater hazard to the public than above ground storage. Because we cannot know when a leak is developing; after it has developed we do not know how far it will travel and cause damage. The biggest factor causing leakage is corrosion. Underground tanks cannot be kept painted and the soil will corrode and assist in the destruction of the tanks. Drainage from cinders on the metal will corrode steel quite rapidly. If tanks are around electric current electrolysis will result. Underground tanks are more susceptible to vibration. We [fol. 136] experience that with underground pipe lines. Where it is absolutely necessary to get lines under a track we put them in the ground and they are a constant source of trouble. I have known two instances where they (pipe lines) have been taken out for that reason. At a plant in New Jersey they raised their pipes (out of the ground) because of the excess leakage which they couldn't find.

We have had two big gasoline tanks ignited by lightning. The tanks began burning around the edge of the roof, the small openings, and in one case the tank was snuffed out by wet blankets, in another case the rain storm put it out. The capacity of these tanks was better than two and one-half million gallons apiece. The wet blankets applied on the top of the tank were taken up by men who threw them over the flames. The men went up on the tanks while they were burning. After gasoline is on fire there is no great hazard of an explosion. These men did not get on the roof, they were on ladders on the side of the tank.

I recall one instance where underground storage tanks in a private residence property were floated out by water. The connections to the tank were broken and the contents were lost, then ran over the lawn. This was a tank furnishing oil to a domestic burner. There was a very severe rain and surface water all around the tank and floated it out. This might occur with a tank that is totally full, or especially with a tank partially empty.

Gasoline is the first product that comes from crude oil in the distillation, it comprises the lightest fractions and is of such a nature that if a match is passed over gasoline it will burst into flame. The mixture necessary to produce

flame is 3 to 7 and 8 per cent of vapor. Kerosene is the next heaviest product. Naphtha is a vague term. It is used to designate different products. Our people class naphtha as heavier than gasoline. In most cases it will not flash at a temperature of 70 or 80 degrees. The next below naphtha is kerosene. This has a flash point or ignition point considerably above ordinary room temperature, and therefore will not ignite so readily as gasoline. It is the vapor that ignites, not the fluid itself. The fluids have to be mixed with air to ignite. Distillate usually refers to products that are heavier than kerosene. Fuel oil is a form which is used to cover anything burned in a burner, but ordinarily refers to heavier products than distillate. The limitations are very wide because a fuel oil used for domestic use in households is about like kerosene and in a [fol. 137] brick kiln, for instance, it is very heavy. It does not definitely describe a product of petroleum. Crude oil is the natural product from which all these are manufactured. Crude oil and gasoline are classed together as having equal value along these lines (inflammability.) Both will ignite with about the same degree of readiness. Below them is kerosene, distillate and fuel oil. As to the degree of hazard, we consider crude oil the worst product we have. It is a very bad fire to fight; more hazardous than gasoline. When crude oil comes in, no matter how careful the pipe line company or the shipping company is, some water will come with it. This water settles in our receiving tanks and if a tank should catch fire the water would boil and the tank will run over. Gasoline won't do that. Gasoline won't foam as we call it. Crude oil is the worst product to store. It is more corrosive than gasoline. We have to watch our tankage better. A crude oil tank will leak quicker from corrosion than one containing gasoline.

Cross-examination.

By Mr. Bennett:

Leakage from underground tanks would run out and penetrate into the ground. Soil conditions might have some bearing on the rapidity of pentration. There are kinds of soil practically impervious to gasoline or water,

clay soil. We spent about three weeks chasing one gasoline leak. It had run off at right angles to the line. The soil was a yellowish-brown clay. It happened to be in a marshy place, we had filled there. The leak was on the edge of the fill.

Electrolysis is the corrosion of metal, the same as electroplating. It is not static electricity; it is direct current of moderately low voltage. There is no action of that sort in the atmosphere above ground. Static electricity will not destroy any material above or below ground. I don't believe static electricity can occur underground. It is a very high voltage and it can only be held by insulation. We take precautions against it. If we build up a voltage there would be a spark to the ground.

If a gasoline tank fire starts to burn around the opening, the chances are very remote for explosions. Would not say they were entirely removed. A full tank is very unlikely to explode, as the fluid goes down the danger increases. If there were only a small amount of gasoline in a storage tank, and the fire started outside the tank, and the vapor arose and the vents did not relieve it, it would rupture the tank which would give way at the weakest point. Explosion is an internal combustion in a closed [fol. 138] space. It is a pressure failure the same as a steam boiler. When you shut up all the vents it will fail from internal pressure. If a tank ruptures itself and lights against a house 400 or 450 feet away, it would be a condition of pure pressure failure as differentiated from a fire burning inside the tank. We call it a failure under pressure. This tank I mention which floated out contained distillate, a product much more safe from the viewpoint of explosion (than gasoline). This tank that floated out was completely buried, about 18 inches deep, right back of the house. Whether there would be a flow line on a buried storage tank would depend on construction. We use a [illegible] in our refineries. The most practical way to lift the liquid would be out of the top.

Lightning is one of the hazards of the business, one of the causes of fire. An underground tank would probably not be struck by lightning but its venting devices might be. In the cases above referred to, fires caused by lightning, the tank was not struck by lightning. I think the hazards

of fires caused by lightning in above and underground tanks are nearly equal. The vents of underground tanks would be closer to the ground and the vapor would gather around them. The vent would be about 17 or 18 feet above ground in and above ground storage tank. The vent of an underground tank is close to the ground and won't have a chance to dissipate the vapors. If the lightning should ignite the vapor in an underground tank you would have a fire. The likelihood of fire from an underground tank is no more than an above ground tank. If the ground burned long enough it would heat the tank. The tank would get hot and the gasoline would vaporize. Above ground tanks are more exposed to fire if there is a fire around them. Fire would feed from leaks, and from leaks in underground tanks, also. Leaks from underground tanks would come up from capillary attraction; they may travel downward of their own weight, or be floated by water upward. Leaks underground follow channels of their own choosing.

I do not know the regulations of the National Board of Fire Underwriters. We have our own standards of safety which we have worked out and think represent the ideal construction for handling products we have to handle. I suppose underground tanks would be coated with asphalt or something of that sort. We have never built any underground (tanks). The cost of cast iron tanks would be prohibitive; they would have to be very heavy and there would be a chance of having imperfections. Ordinary steel would [fol. 139] be more practical. Coating tanks with asphalt—you are sure to scrape it off or scratch it and that is the point where the corrosion would proceed. In underground storage local conditions in some places might be worse than others. You would always have conditions that would invite corrosion. There would be danger of gasoline coming out either through the soil, or coming to the surface. Men on the job can get to leaks in above ground tanks.

Redirect examination.

By Mr. Evans:

Vapors arising from gasoline are heavier than air. As I recall the average I would say 20 per cent heavier than air.

The vapors which we handle and pump back and try to recover. Vapors when released settle to the ground. A tank underground would increase the possibilities of getting a more dangerous explosive mixture than above. I don't think the fluid could be taken out through the McDonald vent; there would have to be some other opening in the tank to take the fluid out. The lines to an underground tank would have to come up to the top of the ground, and would have to be boxed in, and that would leave a chamber.

It is necessary and advisable from time to time to clean tanks out. Our tanks (in the refineries) are very large and are pumped out completely and then opened, usually on two sides, two manholes in the top, to allow good ventilation, and two in the bottom 24 inches high and about 36 inches across. Then the tank is steamed and stands in the air for several days before men go into it. It is difficult to air out a tank, and it requires watchfulness until the work is completed.

Within the last two months a leak developed in the lines and gasoline was noticed bubbling up out of the ground about 300 feet from where we finally found the leak, but we have had gasoline travel several hundred feet through the earth. One tank was run over and it showed up in a creek bed several hundred feet from the place where it ran over.

Petroleum products do not lose their potency from running through the ground. Whatever distance they have run through the ground at the other end inflammable vapors are produced to the same extent as at the beginning of the journey.

Recross-examination.

By Mr. Bennett:

The gasoline tank mentioned above that ran over was the result of the carelessness of a man, overnight. The tank [fol. 140] was surrounded by a high dike and the gasoline disappeared within the dike and showed up in the bed of a creek several hundred feet away. The tank was 12 or 15 years old so that the earth was well settled and it represented the normal structures that we have in the west part of the state (Missouri). It was a clay and loam soil, not much sand.

The temperature of gasoline in a tank three feet underground wouldn't vary much after arriving at the ground temperature. The temperature in an underground tank depends upon the ground temperature. In summertime would be lower than above ground temperature, how much I don't know. The rate of evaporation would be reduced underground.

Redirect examination.

By Mr. Evans:

A small quantity of gasoline if properly mixed with air would produce just as big a fire as a large amount of gasoline with a small amount of air. If an underground tank was filled with material that was a different temperature than the earth surrounding the tank, the earth and the product put into the tank would arrive at the same temperature in time. In the winter time the tank would be relatively warmer than a tank above ground. Cold fluid put into an underground tank would tend to lower the temperature of the tank. You might rupture the tank if the tank was held rigid so that it couldn't take up the contraction. It would involve a greater hazard of contracting and loosening the seams.

Recross-examination.

By Mr. Bennett:

The difference in temperature of the tank full of gasoline and that that might be be put in there would cause the seams to work enough to cause small leaks and you might crack the tank.

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6. J. E. Dyer, a witness called by the plaintiffs, testified as follows:

(Transcript of Testimony, pp. 107-114)

Direct examination.

By Mr. Doran:

My name is J. E. Dyer. I live in Kansas City, Missouri. I am manager of the Southwest District of the Sin-

clair Refining Company. This district embraces the states of Kansas, Missouri, Arkansas, Oklahoma, New Mexico, Arizona and the south half of Colorado. Have been with the company about ten years. I started to work for the [fol. 141] Cudahy Refining Company which was later taken over by the Sinclair Refining Company. I have worked in a very general capacity in the warehouse and around tankage—kerosene, lubricating oils and also clerical work, involved in the sales, and distribution of petroleum products. At this time as manager of the district I have general supervision of the sales and distribution of petroleum products, the general custody of the merchandise and equipment of the company, including general supervisory powers of the construction of the storage tanks. Mr. S. F. Munroe, under my general supervision, has charge of the construction of storage tanks in the territory embracing the city of Marysville.

I have been acquainted with the property at Marysville for about five years. I was there three years ago. The Sinclair Company purchased the property at Marysville, Kansas, in the month of March, 1917, from the Exchange Bank at Marysville; the bank got it through the bankruptcy of the owner, J. H. Reipen. He built the tanks originally; these are the tanks now there. Mr. Reipen lives in the residence which is located about 58 or 60 feet from the tanks. He has lived there ever since the tanks were constructed and still lives there. There are two tanks, approximately 12,000 gallon capacity; one tank contains kerosene and the other gasoline. The supplies put into the tanks are secured from tank cars which are placed on the railroad siding adjacent to the property. They are filled through an overhead unloading apparatus where a pipe is placed down into the tank car from the top and the contents pumped out by means of a piston pump through the dome and down to the pipe lines and into the storage tanks from the bottom.

The tanks are above ground on concrete foundations elevated approximately 16 inches above the surface of the ground. They are constructed of steel 3/16 inch gauge. Their diameter is approximately 10 feet and height is approximately 18 feet.

The products in the tanks are piped out through the bottom of the tanks through pipe lines into the pumps and then into the truck. We have two pumps, one for gasoline and one for kerosene, located some distance from the tanks. We have a warehouse there. Our property is located on lot 9 in block 71. Tanks are located just adjacent to the spur tracks of the Union Pacific Railway Company which runs through block 71 and close to the tanks. The general surface of the ground there is level, cinders are used on the railroad right of way. These tanks have been operated [fol. 142] since purchased by the Sinclair Company in March 1917; they were operated before that time by Mr. Reipen.

Here the Sinclair Company read into the evidence certified copy of the minutes of the meeting of the Council of Marysville of September 12, 1919, designated by the City Clerk in his certificate as Exhibit A, being the authority by which Mr. Reipen secured the right to erect the tanks, as follows, (Exhibit D):

"At a regular meeting of the Council on September 12, 1910, the following proceedings were had:

'Mr. J. H. Reipen asked the council for permission to put oil tanks on Lot 9, Block 71, Marysville Proper; moved and seconded that the request of Mr. J. H. Reipen be granted and that he be permitted to put his oil tanks on Lot 9, Block 71, Marysville Proper; motion carried.'

(Record Proceedings of the Council for 1909 to 1916, page 57)"

The Sinclair Company here also introduced certified copies of Ordinance No. 237 of the City of Marysville, a part of Exhibit D, designated by the City Clerk in his certificate as Exhibit B., as follows:

"Ordinance No. 237

An Ordinance Providing for the Storage of Gasoline, Fuel Oil, and Motor Spirits Within the City of Marysville

Be it ordained by the Mayor and Councilmen of the City of Marysville, Kansas:

Section 1. That it shall be unlawful for any person to keep or permit to be kept in any building or upon any premises within the City of Marysville, Kansas, more than five gallons of gasoline, fuel oil, or motor spirits, in any one container, and not to exceed two containers on such premises.

Sec. 2. Any person desiring to store a larger quantity shall provide a storage tank, which shall be located underground, except as hereinafter provided, and shall conform to the regulations herein contained.

Sec. 3. All tanks located underground shall have the top of tank at least two feet below the surface of the ground, and below the level of the lowest pipe in the building to be supplied. Such tank shall be set on a firm foundation, surrounded by soft earth or sand, well tamped in place, or be [fol. 143] encased in concrete. A permit for all tanks now located underground within said city, if properly safeguarded, will be issued.

Sec. 4. Tanks may be constructed in the building, if buried at least three feet below the lowest floor thereof, and isolated tanks, constructed for the storage of gasoline, fuel oil, and motor spirits, in quantities of 5,000 gallons, or more, may be constructed above ground at such locations as the Mayor and City Council may determine. Provided, a permit designating the location and manner of construction, must be procured from the Mayor and City Council therefor before the construction of such tanks. Provided, further, a permit for the maintainance of isolated tanks built upon the surface and now located within said city, if properly safeguarded, will be issued.

Sec. 5. That any person violating any provision of this ordinance shall be subject to a fine of not less than five dollars nor more than twenty-five dollars, and be imprisoned until such fine and costs are paid.

Sec. 6. The word "person" in this ordinance shall be considered to include the owners, occupants, and agents of the owner or occupant of premises within said city.

Sec. 7. That all ordinances or parts of ordinances in conflict with this ordinance be and the same are hereby repealed.

Sec. 8. This ordinance shall take effect and be in force from and after its passage and publication in the official city paper.

Passed by the Council and approved by the Mayor, this 13th day of July, A. D. 1914.

Chas. F. Pusch, Mayor.

Attest: T. C. Randolph, City Clerk. (Seal.)
(Published in Marshall County News July 17, 1914.)"

EXHIBIT D

Plaintiff then introduced memorandum minutes of meeting of the Council of the City of Marysville, of October 3, 1923, part of Exhibit D, designated by the City Clerk in his Certificate as Exhibit C., as follows:

[fol. 144] "Council Chamber, Marysville, Kansas

October 8, 1923.

Council met in regular session.

Ordinance No. 350, an ordinance regulating the storage of gasoline, kerosene, naphtha, distillate, fuel oil, crude oil, and other inflammable and combustible liquids within the city of Marysville, Kansas, and repealing Ordinance No. 333, and section 4 of ordinance #237, was passed."

Plaintiff then introduced in evidence Ordinance No. 350 of the City of Marysville, being also part of Exhibt D, designated by the City Clerk in his certificate as Exhibit D, as follows:

"Ordinance No. 350

An ordinance regulating the storage of gasoline, kerosene, naphtha, distillate, fuel oil, crude oil, and other inflammable and combustible liquids within the city of Marysville, Kansas, and repealing Ordinance Number 333 and Section 4 of ordinance Number 237

Be it ordained by the Mayor and Council of the City of Marysville:

Section 1. It shall be unlawful for any person, firm or corporation to keep or store within the corporate limits of

the city of Marysville, Kansas, any gasoline, kerosene, naphtha, distillate, fuel oil, crude oil, or other inflammable or combustible liquid otherwise than in tanks barrels or other containers which shall be buried at least three feet underground.

Section 2. Any person, firm or corporation who shall maintain any underground tank yard shall keep same fenced securely and shall keep at least six inches of gravel, chat, cinders or other large aggregate over the said area so occupied by tanks and shall keep and maintain such tank yard in a clean, orderly manner, free from rubbish, weeds, trash or other inflammable substances.

Section 3. This ordinance shall in no case apply to the storage of any crude oil, distillate or fuel oil in containers of capacity of 500 gallons or less, but only one such 500 gallon container shall be permitted on each premises, nor, shall it apply to the storage of gasoline, kerosene or naphtha in quantities of less than ten gallons, all of which commodities in the quantities mentioned and permitted by this [fol. 145] section shall be kept and stored in the manner as now provided by existing ordinance.

Section 4. Ordinance Number 333 and Section 4 of Ordinance Number 237 are hereby expressly repealed.

Section 5. Any person, firm or corporation violating any of the provisions of this ordinance shall upon conviction be adjudged to pay a fine of $25.00 for each such violation, and each day that any of the commodities herein referred to are stored in violation of the terms hereof shall constitute a separate and distinct offense hereunder.

Section 6. Any person, firm or corporation now storing any of the commodities herein mentioned in a manner otherwise than that herein provided shall be given until the 10th day of November, 1923, in which to bring themselves within the provisions hereof and comply herewith.

Section 7. This ordinance shall be in force and take effect from and after its publication in the official city paper.

Passed and approved this 8th day of October, 1923.
C. F. Travelute, Mayor.

Attest: By Hy E. Clark, City Clerk. (Seal.)

Published in the Advocate-Democrat, October 11th, 1923."

The city clerk's certificate is as follows:

"Certificate of Copy

STATE OF KANSAS,
Marshall County, ss:

I, Henry E. Clark, Clerk of the City of Marysville, Kansas, do hereby certify that the foregoing Exhibit "A" is a true and correct copy of the minutes of the meeting held by the Mayor and City Council of the City of Marysville, Kansas, on September 12, 1910, granting to J. H. Reipen a permit to construct oil tanks on Lot 9, in Block 71, Marysville Proper; that the foregoing Exhibit "B" is a true and correct copy of Ordinance No. 237; that the foregoing Ex-[fol. 146] hibit "C" is a true and correct copy of the minutes of the meeting held by the Mayor and City Council of the City of Marysville, Kansas, on October 8, 1923, at the passage of Ordinance No. 350; that the foregoing Exhibit "D" is a true and correct copy of Ordinance No. 350, as the same appear of record in my office.

Witness my hand and the seal of said city, affixed at my office in Marysville, Kansas, this the 16th day of October, A. D. 1924.

Hy E. Clark, City Clerk. (Seal.)"

Council for the defendants made the following objection:

"Mr. Colmery: Referring only to that part of the exhibit which contains the council's minutes, we object to it as incompetent, irrelevant and immaterial, not binding on these defendants, constituting no equity in the cause nor ground for equitable relief.

"Master: Overruled.

"Mr. Colmery: Note the exception of the defendants to the ruling."

We have no storage tanks in our territory of the capacity of these tanks buried underground.

Cross-examination.

By Mr. Colmery:

I do not know of any structures of any nature nearer the tanks than the residence of Mr. Reipen. From recollection I would say that the Sinclair tanks are about 50 feet distant from the west rail, of the railroal track. The Sinclair tanks are designated on the map (Exhibit A) by two circles. There is no crude oil there and we never stored any crude oil in either of those two tanks. The Sinclair tanks are vertical riveted tanks.

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7. S. F. Munroe, a witness called by plaintiffs, testified as follows:

(Transcript of Testimony, pp. 114-127)

Direct examination.

By Mr. Doran:

My name is S. F. Munroe; residence Kansas City, Missouri; I have been superintendent of construction, maintenance [fol. 147] and equipment for the Sinclair Refining Company for 5½ years; I have supervision of construction and maintenance of storage tanks in the Southwest territory described by Mr. Dyer, to construct, repair and maintain storage tanks similar to those at Marysville, in that territory.

I am acquainted with the tanks at Marysville; have known about them for three or four years. Was there last week. I know the character of the equipment of those tanks and the cost of constructing such tanks. I keep accounts and hire labor and buy material, and all that kind of business. Our property is located on lot 9, block 71, south half, on the west side of the switch of the Union Pacific Railroad Company in the City of Marysville; approximately 27½ feet from the railroad track. The capacity of the tanks is approximately

12,000 gallons each; they are 10½ feet in diameter and 18 ft. 7 inches high. They are constructed on concrete foundations; the foundation is approximately a foot above grade. The steel is 3/16 inch thick, with an 18 inch manhole in each tank and a 2 inch McDonald vent, or relief valve, on each tank. There is an overhead loading apparatus located on the spur track of the Union Pacific and in the warehouse we have two McDonald pumps, one for each commodity (gasoline and kerosene). The warehouse is located on the east side of the lot, approximately 23 feet from the north side of the lot; it is made of galvanized iron. There is a little Ell on the west side of the warehouse building that has a gasoline engine apparatus, the pumps. The unloading rack is located next to the railroad track; six feet clearance from the outside rail, and from that unloading rack running to each pump are two pipe lines. We have a separate pump and pipe line for gasoline and kerosene. There are two more pipe lines that run from the pumps back to the tank, entirely above ground. There is an unloading platform from which the stock is pumped through the same pumps from the tanks to the distributing truck.

The McDonald vent is approved as standard by the Underwriters Laboratory and accepted as standard by most of the large oil companies.

I was told that Mr. Reipen lived there in the one story residence designated on the map on the west half of the south half of block 71. There is a small frame shed or outbuilding, used as a woodshed or something, between the Reipen residence and the Sinclair property. There is a building, I would call it a barn and shed, for storage, just a frame shack, on the Northwest corner of the Reipen lots. [fol. 148] There is a coal shed on the east side of the railroad track. I couldn't say just the distance from our plant without scaling it (on the map).

The distance from the Sinclair property to the Standard Oil Company property is approximately three blocks. One block east and two blocks north. I was there last week. I was comparing what I saw while I was in Marysville with the (building shown on) the map, and I can state that it was the same with the exception of this small building here (indicating) which was burned down.

I have made an estimate of the cost of compliance with Ordinance No. 350 by burying these tanks underground.

"Q. You may state to the Master what it would cost to bury tanks underground and comply with this ordinance.

"Mr. Bennett: We object as not the best evidence.
"Master: Overruled.
"Mr. Bennett: Note our exception.

"A. The cost would be about $3,850.00.
"Master: For both tanks?
"A. For the two tanks.
"Q. Both tanks?
"A. And other things with them."

In making the estimate I took into consideration the cost of excavation and material. I inquired for prices at Marysville.

I have an opinion as to the relative hazard of maintaining tanks above and underneath the ground.

"Q. You may state what your opinion is as to which is the safer?

"Mr. Bennett: We object as the witness is not shown to be qualified to answer, calling for an expert opinion.
"Mr. Doran: I think he has shown a sufficient qualification.
"Master: He may answer subject to the objection. I will take it under consideration.

"A. My experience has been that it is impracticable to bury large storage tanks and maintain them safely."

[fol. 142] Under my personal observation we have only had one real large tank buried underground, but we have had numerous tanks from 500 to 200 gallons and the maintenance of tanks of over 1000 gallons underground is almost prohibitive for the reason that they have to be removed to be taken care of.

"Q. From a safety standpoint will you tell the Master what difficulty would have to be met in maintaining and operating such tanks underground?

"A. The tanks would have to be constructed of heavy, very heavy material for underground storage and the displacement on a large tank is so much greater that it would cause a great deal more strain to be put on the tanks when buried."

It would be impossible to discover leaks. Leaks are our worst trouble and it is necessary to watch them constantly, and take care of them. Our inspection is very rigid. We have a good many men in the field—agents, field supervisors, maintenance and equipment men—and the tanks are constantly inspected by the agents. It is necessary to clean out tanks. It would be impossible to clean them out underground. The tanks at Marysville are vertical tanks and are not practical for underground storage, they would have to be discarded.

Cross-examination.

By Mr. Bennett:

I am Superintendent of Construction for the Sinclair Company. I was in Marysville last week. The property is not diked. Diking is a safeguard in some instances. For instance, the railroad company might require it where the tanks set above ground alongside the main line right of way, so as to divert the contents of the tanks in case the tanks burst and the stock runs out, to divert the flow. Generally, I would not say it was improper or proper, either one. The purpose of diking is in case of a tank being broken or the pipe lines coming off, to divert the stock from the surrounding buildings, especially main line right of way where passenger trains pass. Unforeseen circumstances might arise whereby a tank might be damaged and the stock come out and naturally flow whichever way the ground is sloping. In several years in this business I have never known of an occurrence of that kind at bulk stations, and it is very rare. I have no personal knowledge of underground tanks leaking and causing an explosion, but I have personal knowledge of underground tanks leaking, and above ground tanks also, but they are immediately repaired. Our inspection is very rigid. When a tank is cleaned out the tank is [fol. 150] emptied. We clean out a certain amount of waste

matter of one kind and another, scale from pipe lines, sometimes dirt in the tank cars. I have known instances of birds building nests in the unloading racks and being swept into the tanks. A certain amount of dust will get in and settle. Our tanks are tested for both water and waste matter. If it is just water we pump it out.

A horizontal tank has to be watched more closely than a vertical tank. There is no question of safety between a vertical and a horizontal tank, one is just as safe as the other.

MEMORANDUM AS TO EXHIBITS "A" TO E

Here the attention of the witness was called to defendants' Exhibits A and B, pictures of the Sinclair Refining Company plant at Marysville, also to defendants' Exhibits C, D and E.

Exhibit C shows the Cities Service Company's tanks.

Exhibit D shows the Sinclair tanks, on block 71.

"The next one" (Exhibit E) is a picture showing the Crew-Levick and Derby tanks, and the location of the Fenwick tanks and the coal sheds adjacent, and two small houses in block 71.

NOTE.—Here the Clerk will insert copies of Defendants' Exhibits A, B, C, D, and E, offered in evidence.

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8. WILLIAM F. PARLI, a witness called by the plaintiffs, testified as follows:

(Transcript of Testimony pp. 127-140)

Direct examination.

By Mr. Doran:

My name is William F. Parli; residence Marysville; local agent for the Sinclair Refining Company. As such I have immediate charge and supervision of the Sinclair Refining

Company storage tanks in the City of Marysville, Kansas. I have occupied this position since about the middle of February. I take care of the company's business at Marysville. Receive stock in large quantities and tank car lots, store it and then convey it to the public in truck lots. It comes in the tank cars on the railroad. It is drawn out of the top of the tank cars with a suction pump and discharged into the bottom of the storage tank. All lines carrying the products are above ground, leaks can be readily seen and repaired. Foundations under the tanks are solid concrete slab.

We have done all the way from 12 to 16 thousand gallons of business in a month. We have a service station there and [fol. 151] supply it from the large (storage) tanks. Tank cars can be there for some time for the reason that several different oil companies—the Cities Service and the Derby and myself—use about the same "spot." (Place for unload.) These tank cars are kept on the sidetrack before they are "spotted." They are detained in the yard over day or night. They hold 6 to 8 thousand gallons. They might be in the yards several days sometimes.

The Sinclair tanks are fenced with a very good fence, five feet high, of woven wire, fine mesh. Very heavy wire. With two barbed wire strands above. The tanks are separated from the railroad tracks and the public by this fence. People would have to crawl the fence or go through the warehouse (to get to the tanks). The products are delivered from the tanks by trucks, holding about 320 gallons. Gasoline and coal oil are pumped from the storage tanks into these trucks. It is my business to take out gasoline and kerosene in large quantities to anybody in the farming community or in the local community. In serving customers the truck goes through town, it is a necessity of the business. The tank cars are kept in the yard as a necessity by the railroad without fault of the Sinclair Company.

There are no weeds inside the fence, it has been scraped with a hoe. The weeds shown in the picture, defendants' Exhibit A, are not the Sinclair Company's weeds.

The block where the Sinclair Company tanks are located is sparsely built up.

"Q. Is there not a large tract of land closely adjacent thereto not built up at all?

"Mr. Bennett: We object as incompetent, irrelevant and immaterial and not within the issues.

"The Master: Overruled.

"Mr. Bennett: Note our exception to the ruling."

I have lived in that county all my life, born there. Was in Marysville frequently. The conditions in Block 71 are the same now as they were for some time past. There are no more houses there than shown on the map (Plaintiff's Exhibit A). The Derby and Crew-Levick plants have been there a good while. I know Mr. Reipen; he is my nearest neighbor. (Points out Reipen's house on the map.) There is a sort of a little hen house there, and toilet. They have been there since witness can remember. Mr. Reipen lives [fol. 152] there now. The frame shed (north and west of the Sinclair property) across the alley, (indicating by pointing to the map) is burned down. There is nothing there now. The Sinclair Company did not burn it down. The territory in Block 72 (just west of 71) and block 81 (just Southeast of 71) is all vacant. All the houses there are there (in block 82) south of block 71 (two in number) are shown on the map. (The rest of the block is vacant.) There hasn't been any change except the one burned down.

We sell to garages in Marysville; at the present time only one. I know of a good many people who burn petroleum products for heating their houses. There is a one thousand gallon tank at the house of Jack Neaton. He is known as "Jack the Cleaner." He cleans and presses clothes. He also has a 110 gallon tank up at his place.

"Q. Where is that with reference to the nearest building?

"A. I should say not over four feet.

"Q. What part of Marysville is that in?

"A. The place would be between fifth and sixth on Laramie.

"Q. Is that the closely built up district of Marysville?

"A. Very thickly populated residential district.

"Q. That is the 1000 gallon tank?

"A. Yes.

"Q. Where is the 100 gallon tank?

"A. Uptown, on Broadway.

"Q. The main business street?

"A. Yes.

"Q. How close to the building is that?
"A. A foot or two foot. Right against the building.
"Q. Buried or above ground?
"A. Both are above ground.
"Q. Who else do you know that has a tank to keep fuel?
"A. Mr. Van Reisen, a druggist.
"Q. How much has he got, do you know?

"Mr. Bennett: We object because this is entirely without the issues of this case and affords no grounds for equitable relief.
"The Master: Overruled.
"Mr. Bennett: Note our exception.

"Q. What size is his tank, about?
"A. As near as I can tell it is about 500 gallons, just by going by on the street."

[fol. 153] It is about 8 or 10 feet from his building. It is on Fifth and Broadway, our main street, which is closely built up there. That is also true of Jack the Cleaner's place.

B. E. Long, an insurance man, has a 500 gallon tank in a section of the city more closely built up than the territory surrounding the Sinclair tanks.

Franz Benson has a 500 gallon tank not over two feet from his residence. It is well built up around there, more closely than around the Sinclair and Standard tanks.

Ingalsbe, the druggist, has 150 gallons—three 50 gallon barrels connected in series under a porch that extends out from the house in which he lives, a six or eight room house, close to adjacent buildings in a well built up portion of the city. More closely built up than around the Sinclair and Standard property.

Mr. Weeks has the same outfit—three 50 gallon barrels and under the same circumstances.

I could locate a dozen men who are using tanks of that character to store crude oil, distillate, etc., in tanks of 500 gallons or less. I casually observed these tanks, didn't search the town to find out how many there are.

There are several hundred automobiles in Marysville. The tank on a Ford holds about nine gallons. There is quite a "swarm" of them there. They are kept in garages over night. A lot are kept on the public streets during the day time. None of them are buried. "A lot ought to be."

Cross-examination.

By Mr. Bennett:

I have lived in Marysville since February; came from Axtell. In Marysville on business about once a month before that. There a full day, generally. Drove around Marysville, down on Sixth and Fifth streets and over town. Block 71 is sparsely settled. There are three houses on it. Three oil warehouses and tanks; four warehouses and tanks, including the ones buried, the coal chutes and little adjacent outbuildings. The Sinclair property does not cover the entire lot (lot 9). The fence around the Sinclair property is 25 or 30 feet from the street; there isn't much of a street there. The property of the Sinclair Company is cleared (of weeds) three feet from the outside of the fence. Mr. Van Risen's fuel tanks are back of his house, [fol. 154] between Fifth and Sixth Streets, in the heart of the city, about 3½ blocks from the Standard Oil Company tanks.

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9. A. S. Hopkins, a witness called by plaintiffs, testified as follows:

(Transcript of Testimony, pp. 140-159)

Direct examination.

By Mr. Evans:

My name is A. S. Hopkins; residence Neodesha, Kansas. I am superintendent of the Standard Oil Company of Kansas. That is not the defendant in this case. I have resided at Neodesha, Wilson County, about 47 years. My duty is supervising the operation and maintenance of the refinery. Gasoline, naphtha and crude oil, and other products of petroleum are stored there. Our gasoline stocks for the past ten years would average from six to thirty million gallons daily on hand. The stock is kept in tanks above ground.

I have given consideration to the best means of safely storing gasoline and products of crude petroleum.

"Q. And have you an opinion, Mr. Hopkins, as to the relative hazard from the standpoint of public safety of storing these products above and below ground?

"A. Yes.

"Q. You may state to the Master which in your opinion is the more hazardous?

"Mr. Colmery: To which the defendants object as incompetent, irrelevant and immaterial and no proper foundation laid and attempting to usurp the function of the Master and the Court.

"The Master: Overruled.

"Mr. Colmery: Note our exception.

"A. I prefer above ground storage.

"Q. Why?

"A. Because you can keep your tanks in good condition—you can inspect them regularly and they are not so susceptible to corrosion, which causes leaks. You can keep your tanks painted."

The advantage in that is that paint will preserve metal, thereby preventing corrosion. Your storage is more accessible above ground. There is a big advantage in cleaning tanks (above ground). It becomes necessary to clean tanks periodically on account of accumulation of water and [fol. 155] settlings, rust that accumulates in the tanks. Tanks on top of the ground are much easier cleaned because you can dump the tank and drain out these settlings and impurities, and you can ventilate the tanks by opening the bottom and top manholes and get a circulation of air through the tanks. That is necessary or desirable because when they are not ventilated it is dangerous to enter the tank, and it is necessary to enter the tanks to clean and inspect them.

The effect of cinders on a tank in the ground is that drainage from cinders carries acids which attack the metal, which corrode and eat it up. The effect is to weaken the tank and make leaks. We have had a lot of (pipe) lines in the ground eaten up by water running over cinders. Where our lines are buried underground we are constantly having trouble with leaks. In the past 8 months we have spent thousands of dollars in digging up our oil lines, raising them above ground and placing them on supports. We do

this to get away from this corrosion and action of the water underground attacking the lines. The ground around our tanks is saturated with oil at various depths. On one occasion we were delivering oil out of our plant to some tanks located about a mile from our plant, during the night time this line sprung a leak; it was not discovered until morning, when the oil was shut off and the leak repaired. Several days after this, nearly a week, a neighbor who lives a short distance from the plant complained to us of having oil in his water well, about 700 feet from where the leak occurred. At first we rather doubted that we were responsible for the oil in his well. We analyzed and found it the same oil that escaped from our line. Gasoline and other petroleum products will run through the soil. I do not know of any soil that it wouldn't penetrate. Gasoline and these other products of petroleum do not lose their efficiency or inflammability in traveling through the ground in the manner described, to any appreciable extent. After traveling a distance of 700 feet the gasoline found in the neighbor's well would burn.

Gasoline is a natural and the most volatile product of petroleum. Naphtha is a general term that we apply to low grade gasoline and products between gasoline and kerosene. Kerosene and distillate are products that follow gasoline. They are less volatile and have higher fire tests. Gas oil is a product that follows kerosene and is of a low volatility, lower than kerosene, and fuel oils are generally the residue of the products. Crude oil is a volatile product. I would class crude oil and gasoline as the most inflam- [fol. 156] mable and the stock we call naphtha second, kerosene and distillate third. I class crude oil with gasoline because the lighter products are in there and it is as volatile, it will flash below atmospheric temperature.

I have had experience with burning tanks containing these various products. Have observed how they act under fire. I have seen 8 tanks ignited by lightning; three of these tanks contained gasoline, three crude oil tanks and two refined oil tanks. The gasoline tanks caused no trouble at all, the fire on two of them was whipped out with blankets. The third was equipped with a vent line; this line was closed and snuffed out the fire. The contents of the crude oil tanks were burned entirely. The two kerosene tanks resulted in a violent explosion within the tanks and the

roofs were blown off. The fire was put out by steam. The crude oil tanks contained about 8,000 barrels each; a barrel contains 42 gallons. Gasoline tanks ignite from the outside. Very rarely will you have an explosion or explosive mixture within the tank. Gases generate so fast that they are driven out.

One tank contained about a million gallons. This tank a man went up and threw a blanket over the hatch. The man who went up understood the hazard; he did it without hesitancy. He is now superintendent of one of the largest refineries in the State of Ohio.

"Q. Which is the more hazardous from the standpoint of public safety, crude oil or gasoline?

"Mr. Colmery: We object for the same reason previously stated.

"The Master: Overruled.

"Mr. Colmery: Exception.

"A. I would place them about on a par. Crude oil will cause the most disastrous fire. Because crude oil contains a certain amount of moisture. It is seldom free from water which is carried in suspension clear to the top of the tank. The oil foams when burning. When the boiling starts it runs out of the tank and clear over the dike. With gasoline the fire is always outside of the tank and away from the oil and the oil doesn't get very hot with a gasoline fire."

I have seen one tank, buried in the ground, flooded out. A year ago our school board put in oil burning equipment in the school buildings and buried a 2,000 gallon tank filled with oil. They had been using oil out of this tank for two [fol. 157] or three weeks, when one night there was a hard rain and in the morning that tank was about half on top of the ground. It broke off the connection leading to the fires and they lost what oil they had in the tank. It ran around on top of the ground. That might occur just as well with a ten or twenty thousand gallon tank in the ground. Water is heavier than the tank and its contents and it just floats. In an underground tank there is danger of having the tank cracked or seams loosened by change of temperature of the contents. In a large tank there would be quite a strain on

the metal if the temperature changed much. A buried tank in the winter time would be warmer than the outside atmosphere above ground. Cold fluid dumped into the tank would cause contraction of the tank that would place quite a strain on the metal; the larger the tank the greater the strain. It (contraction caused by cold fluid dumped into the tank) would naturally make the tank smaller, leaving some space in the earth sur-ounding it. The vapor that rises from gasoline or other petroleum products is from 25 to 45 per cent heavier than air.

Cross-examination.

By Mr. Colmery:

I have been with the Standard Oil Company 27 years, 12 years as superintendent of the Neodesha Refinery. Prior to that time I was for ten years assistant superintendent. I was employed there prior to that time.

We store petroleum products at refineries in steel tanks with vapor tight roofs. They are vertical tanks. The cover is fitted tightly at the top edge, absolutely, with lines that run from the roof of the tank out and extend over a fire wall or dike fifty feet away. The larger tanks are diked. Some of the smaller ones are not.

Of the eight tanks ignited by lightning which I saw, I actually saw the flash that ignited one of them. I have been on the ground a few minutes afterwards. All were ignited by it (lightning) passing over them. I think if any of them were "a direct hit" there was no indication of it. They were located in our refinery yard at Neodesha. Two of these fires were snuffed out by wet blankets. We could have taken our coat off and put it out. We keep the blankets on hand for that. Two of the tanks spoken of as burned contained kerosene, there was an explosion in one of them that ruptured the roof. There wasn't any pressure on the [fol. 158] tank, there was an explosion of the gases under the roof. That would be due to a mixture in proper proportions of the oxygen and gas.

I only know of one instance of oil flowing into a water well. We have found the ground full of oil in our plant from leaks from the pipe lines. The top two or three feet of the soil there is a sandy loam and under that a yellow

clay. I know of no soil which is impervious to gasoline. Such a soil would be a valuable product if you could get hold of it. Our refinery was started on the 16th day of February, 1897. I don't think it possible that oil or gasoline percolating through the sandy loam would strike yellow clay and seek its course along the yellow clay.

I have seen a ninety foot tank floating in 12 inches of water. If you put 12,000 gallons of gasoline in a tank in a river it would float, unless the tank was of very heavy metal. It is possible to avoid floating if you could make it heavy enough. The rain that floated out at Neodesha was not an unusually heavy one. It came during the night. The tank was located on the High School grounds in the north part of the city. The drainage runs away from the grounds. I don't believe it would be practical to tile buried tanks to prevent them from floating. The tank could be so anchored that it would not float.

Naphtha is a term applied to a more or less general group of products between gasoline and kerosene. I think most refineries so class their stock or name it.

In speaking of experience with pipe lines, I mean the lines around the refinery, that is the kind of line I testified about. It had been in the ground since 1913. These lines are some of them full of holes. We have been digging them up for three or four years, repairing them. They are made of steel.

The tanks at the refinery have a capacity of from 200,000 to 2,500,000 gallons.

I stated that crude oil was a great fire hazard because it carries a certain amount of moisture and after burning some time it becomes heated and starts foaming and foams over the tank and will run for maybe several hundred feet from the tank in a foaming mass. If gasoline leaks from a tank it may catch fire and will burn as it runs. If a gasoline tank catches fire and is the proper kind of a tank with vent line, you could let it burn indefinitely. If the vent line does not take care of the vapors, it would gradually gather pressure on the tank, and if the pressure kept accumulating [fol. 159] it would seek another outlet and break the tank. As long as the tank was making vapor it would burn outside. If the tank is equipped with a vent far enough from the tank so the heat would have no effect. The flames

would shoot up in the air. The pressure would have something to do with how far the flame shot up. Gasoline burns with a particularly hot flame. If fed fast enough it would be carried by the wind.

Exhibit F. looks like a fire in a small storage tank—ten to twenty thousand gallons. With that much smoke and flame it could be whipped by the wind so as to be dangerous to surrounding property. I don't think it would reach 50 feet. It would take a pretty strong wind to make it reach a building 27 feet away. Winds in Kansas have considerable pressure and velocity at times. The flame shown in Exhibit F. does not look very high, looks like it was all smoke. I would take the light spot in the picture for flames. I wouldn't consider a fire in a 12,000 gallon tank, equipped with fire screen in vent, would be much hazard 58 feet from a house. The fire shown in Exhibit F. is unusual. It would be a danger. I wouldn't feel that there was danger of an explosion. If there was pressure on the tank there might be a rupture, and if there wasn't a great deal of liquid inside it would build up pressure pretty fast and might set fire to a house 58 feet away or 99 feet and 2 inches. With fire surrounding a gasoline tank that way it is pretty hard to specify the danger zone.

I classify crude oil and gasoline together because they are of the same relative inflammability. If the National Board of Fire Underwriters has placed them in different classes that would be merely a difference of opinion. The opinion which I entertain is the opinion that prevails among engineers and the petroleum industry.

Redirect examination.

By Mr. Evans.

I don't see how an 18,000 gallon gasoline tank, vented with a 2 inch vent and a manhole approximately 18 inches, could part or explode from internal pressure if the fire was applied from the outside. I don't think it practical to tile around a buried tank to prevent it from floating out. There would be a likelihood of the tile forming chambers for the collection of gas. Gasoline vapors would find a way into the tile. We never lost a barrel of gasoline by fire.

[fol. 160] Recross-examination.

By Mr. Colmery:

None of the gasoline in the three big storage tanks burned up. Vapor from the gasoline was burning. Comparative strength of the shell of the tank and the place where it is riveted depends upon the construction of the tank. In case of welding the shell probably is generally stronger than the seams, but the seams can be made as strong as the shell. I wouldn't say that the seams are stronger than the shell as it is very hard to tell when you get a good job of welding.

Redirect examination.

By Mr. Evans:

In the summer time underground storage would be cooler than above ground storage and give off less gas, in the winter the reverse would exist.

A. J. Brooks, being recalled, testified as follows:

(Trans. of Ev., Vol. 1, pp. 159, 161)

In 1920 the Missouri River raised and the high water caused the tanks in our A station at Atchison, Kansas, to raise up through the floor of the building. All of the connections were broken and about forty thousand gallons of product ran out and back into the basement. We put guards around immediately and then by means of pipe lines pumped it all into the river.

Cross-examination:

These tanks were buried in a pit about forty-four feet square and sixteen feet deep, from the floor to the bottom of the pit, and were covered with wood joists and two inch flooring but not with three feet of earth.

Mr. Bennett: We move to strike the testimony of this witness with regard to the floating out of the tanks.

The Master: Overruled.

Mr. Bennett: Note our exception to the ruling.

We had built a square pit or room and the Missouri River got up and filled it full of water and the tanks floated. I do not believe the Missouri River runs up to Marysville. We have no tanks buried in stations similar to Marysville and I have never seen any so buried. If we maintained tanks at Marysville in compliance with the terms of the ordinance, we would have to have connections to get out products in and out of them. That does not refer to the manhole. These [fol. 161] connections are absolutely essential because you could not get liquids in there without such pipe connection. We could not run a pipe line through the manhole or the vent pipe.

Q. How would you go about burying tanks in Marysville?

A. Well, say, I tell you if I was using my own money to put those tanks in at Marysville, I would not put them in.

Q. Just answer the question.

A. I cannot.

Q. How would you go about complying with the terms of this ordinance?

A. We would not do it. I do not think the company would do it.

The only way you could get oil into a buried tank would be by a permanent connection.

H. C. Griffin, called as a witness for the plaintiffs, testified as follows:

(Trans. of Ev., Vol. 1, pp. 161-165)

I reside in Kansas City, Missouri, and am manager of the Standard Oil Company for a territory which takes in the eastern one-third of Kansas and the Southwestern quarter of Missouri. I have been in the oil business twenty-five years and during all of that time have been connected with the Standard Oil Company. My duties as Manager are to direct sales of the company in the territory under my supervision. I am familiar with the manner in which our company sells its products at its stations throughout the territory and how it keeps and stores them. I have an opinion

as to the relative hazard from the standpoint of safety of the public of storing gasoline and kerosene and other products of petroleum above ground as compared with the underground storage.

Q. What is that opinion?

Mr. Bennett: We object as an attempt to usurp the province of the Court.

The Master: Overruled.

Mr. Bennett: Note our exception.

A. My opinion is that storage above ground is safer than storage underground.

Q. Why?

A. Because it is much easier of supervision.

Supervision is necessary or advisable in the consideration of this hazard because any tank in time has a tendency to [fol. 162] leak—seepage or leaks which can be corrected easily if you can see them. These leaks and seepages occur in the connection of the tank with the pipes or in the riveting. These occur occasionally from the pressure that is in the tanks and a very small opening occurs which will grow larger if left without being corrected or repaired. Then too the material of tanks above ground can be preserved by painting. I know of a tank that was under ground for some years that leaked and caused gas to appear in a residence some four hundred feet distant. I investigated it and went all over our plant. We found considerable leakage. The water mains went off across the country towards the residence and we followed the pipes. We had no means of watching the liquid, not being able to look at the outside of the buried tank and watch for moist spots or evidence of leaks. It had leaked quite a good deal before it was discovered. It was impossible to see the tank and unless the gasoline came to the top of the ground we would not know it was leaking.

Cross-examination:

The leaky tank referred to was in Dekalb, Illinois. As to the length of time it had been underground would be a mere conjecture but I would say six or seven years. I think it was a tank of common size ten by thirty feet with

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a capacity of 350 barrels or 10,000 gallons. The gasoline apparently ran along the water line into the house and appeared there in the kitchen sink. I did not determine what kind of gas it was but would not think it was sewer gas, but I could not distinguish them. We took the tank out of the ground, removed the cause, and the gas disappeared about two days after. I have been in the oil business twenty-five years and possibly cannot tell in that way sewer gas from gasoline vapor. I am of the opinion that underground storage is more dangerous than above ground storage for the reasons I have given. The lady who was washing dishes in the kitchen of the house mentioned discovered the odor of gas which apparently came out of the drain in the sink. I do not think it came through the water pipe. Gasoline will follow crevices and pipe and it would be necessary for it to have something of that nature in order to flow through the ground. I could not answer as to whether or not this would result where the soil was reasonably impervious to gasoline. We assumed in the case that I have mentioned that it followed the pipe line.

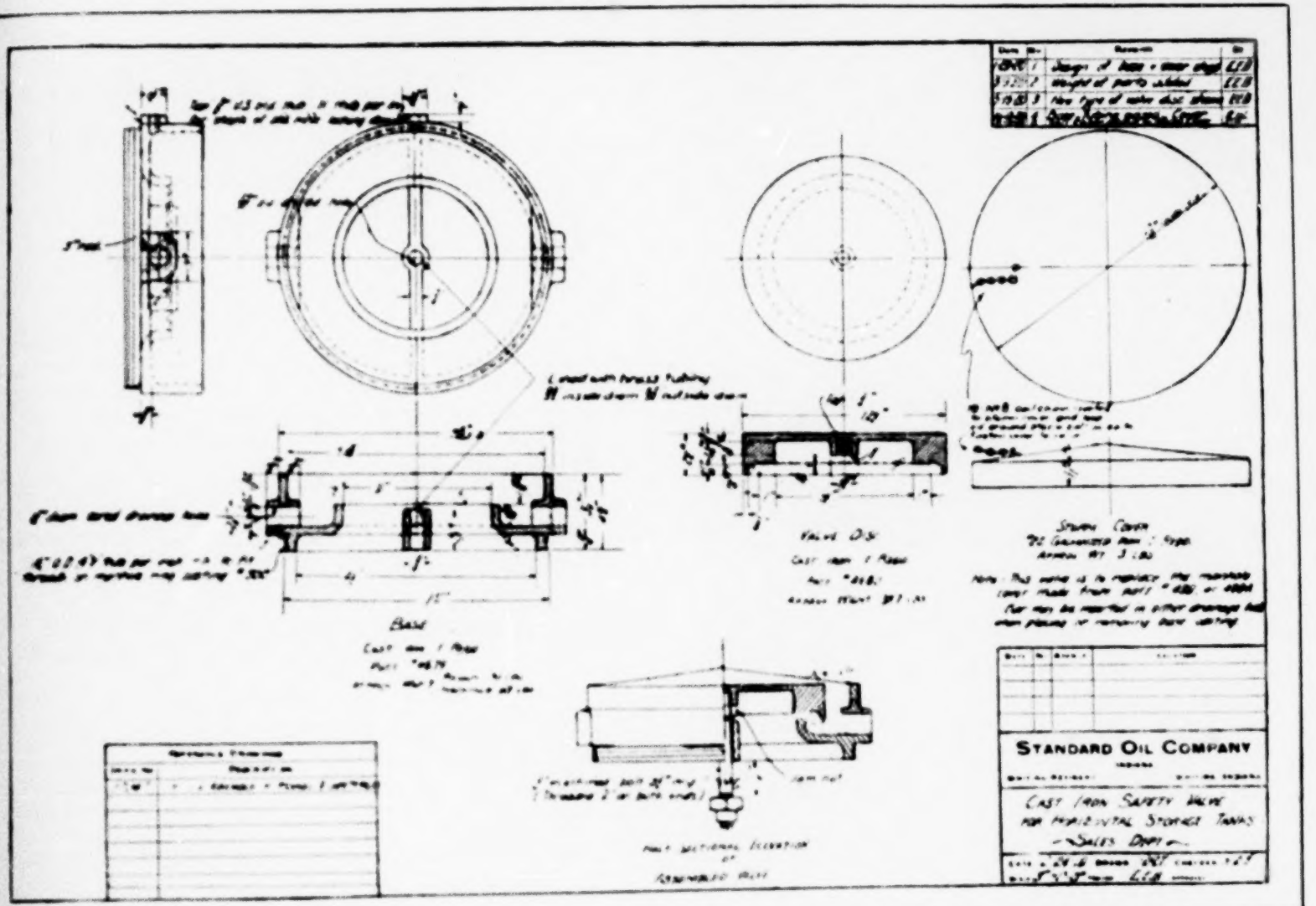
[fols. 163 & 164] C. H. Wagner, being called as a witness for the plaintiffs, testified as follows:

(Trans. of Ev., Vol. 1, pp. 165-167)

The model introduced is just a miniature of a manhole safety device. This (referring to the exhibit) represents the screw that screws into casting riveted on top of the tank. This (again referring to exhibit) represents the valve that raises and lowers with pressure. On this we generally have a lock nut. That gives us an opportunity to raise and lower the depth of the opening. That functions in the manner of this valve here (referring to the exhibit) opening and unseating itself from the casting at that point right here (indicating on exhibit). When this valve stem rises it opens right here permitting the vapors to escape in this manner. This is the tank down here (indicating on exhibit) and the gases come up from here and out there. I did not quite make clear yesterday in my talk the function of this valve. This demonstrates thoroughly how

PLAINTIFFS EXHIBIT E

165=166



it looks (referring to exhibit). The valve is of the diameter of 18¾ inches and the galvanized top used for the purpose of keeping the moisture out fits over all.

The plaintiff offered in evidence Exhibits E, F, E being the blue print and F being the valve.

(Here follow exhibits, marked side folio pages 165 and 166)

[fol. 167] Cross-examination:

This part weighs approximately twenty pounds and it requires a pressure of approximately three-fourths of a pound to the square inch to raise it. A slighter pressure is taken care of with the McDonald safety valve. The Standard has two tanks there at Marysville in which it keeps gasoline and kerosene, but no crude oil, naphtha, distillate, fuel oil or other inflammable or combustible liquid. We do not keep or store or offer for sale there any of the others. The pressure of gasoline vapors depend on the heat of the gasoline. I know that it takes three-fourths of a pound to the square inch to raise the manhole lid by figuring it out mathematically. The more heat applied to a liquid the more vapor there is, and the more vapor we have the greater the pressure you have. You would obtain more pressure by applying more heat.

H. R. Boehmer, being recalled as a witness by the plaintiffs, testified as follows:

(Trans. of Ev., Vol. 1, Pages 167-172)

The burning of petroleum alone does not give off any spark or flying ember. The old construction of tanks called for wood roofs on tanks and in cases where they burned the fire would release charcoal.

Cross-examination:

Witness was then asked to observe paper marked Exhibit F and asked what it appeared to be. In answer he stated that it appeared to be some sort of tank burning.

I doubt very much whether that fire would set fire to a building 58 feet away, and I would not regard it as a hazard.

If I lived 58 feet away from it I would see that the tank was provided with the necessary safety devices but do not know what kind of a tank it is. But assuming that it is a gasoline fire, I would see that proper precautions were taken to put the fire out, using anything to try to smother it. I do not think it is a gasoline tank fire. If it was properly fitted with safety devices I do not believe it would make an appearance like that.

Q. If it were fitted with a McDonald vent and a loose manhole cover would it be possible for it to get in that condition.

[fol. 168] Mr. Doran: I object to any such question. It isn't what kind of a fire that is. I don't think there is such a state of facts here that a question can be based on them.

The Master: Overruled.

A. I would still want to know whether you are figuring on a vapor fire out of the vents.

Q. I am talking about a tank containing gasoline. Assume that it contains gasoline and it is equipped with a McDonald vent and a loose manhole cover?

A. It appears that the top of this tank is gone.

It looks to me like a product other than gasoline burning and that the roof has been destroyed, but assuming that the tank is a vertical steel tank, such as ordinarily used by Sinclair and other companies for bulk storage, fitted with a McDonald vent and a loose manhole cover and filled with gasoline, I would say that I do not think it could get afire like that. I gave an opinion to the effect that underground storage is more hazardous than above ground storage and that is the opinion followed in refineries and in the refinery business. I think the reasons I have given for the methods we follow in refineries is applicable to the bulk storage. I do not know of any difference of opinion among experts on this question and I have talked with our own staff and people with other plants of ours in our own organization. I testified that underground tanks corrode and rust out eventually from soil corrosion. There is no method known to science or engineers by which to make tanks absolutely proof against that but a tank above ground can be painted and that will make it last indefinitely. There is always a strong

chance for asphalt being scraped off, which danger is not present with a tank above ground, because it is fixed after it *if* put up on its permanent foundation. I am to some extent familiar with the operation of welding seams in tanks. All welded seams present an unknown factor of safety. Sometimes it is all right and sometimes it is not. A proper weld is as good as the metal itself but you do not know until it has held or failed under pressure whether you have a proper weld.

Redirect examination:

A fire of a properly constructed gasoline storage tank burning at the vents would not be as hazardous fifty-eight feet away from a residence as a fire would from a burning building at equal distance. I do not think that the fire re- [fol. 169] ferred to in Exhibit F is a gasoline fire. If it is, the tank was not properly vented.

Q. Mr. Boehmer, Mr. Bennett asked you if you had consulted others engaged in the same business respecting the relative hazard of tanks above and under ground and I think you stated you had consulted others in your own company. In order that the Master may understand, please state what, if any, other refineries your company has other than the one you are concerned with at Sugar Creek, Missouri?

Mr. Bennett: We object as incompetent, irrelevant and immaterial.

The Master: Overruled.

Mr. Bennett: Our exception.

A. Whiting, Illinois, just outside of Chicago.

Q. State the capacity?

A. Whiting has a normal of 45,000 barrels of crude daily. And at Wood River, Illinois, across from St. Louis, normal capacity of about 15,000 barrels per day, and then we have plants at Casper, Wyoming; Greybull, Wyoming; Laramie, Wyoming, with which individual capacity I am not acquainted. The one at Casper is as large as Whiting.

Q. And your opinions are based upon your experience and after conference with various persons connected with your property in these plants?

A. Yes, and following out the practice of these plants.

Recross-examination:

No, I do not think there would be danger of the tank developing rupture in this picture. It looks as though the whole roof was off the tank. I know that the Sinclair Company did build a pipe line from the Teapot Dome and I am acquainted with the stub line that came from the junction line of Sugar Creek. It is buried just as close to the surface as they can lay it without interfering with the use of the land by farmers. That is a recent construction of quite a size but I am not acquainted enough with pipe lines to know whether it is the most recent bit of large construction undertaken.

Redirect examination:

The pipe line has to be kept underground because most of the land is worked by farmers who want to have the line [fol. 170] covered so they can till the soil. In our plant the lines are on the surface so that we can repair them.

JOHN G. GAMBER, called as a witness for the plaintiffs, testified as follows:

(Trans. of Ev., pp. 173-193)

My name is John G. Gamber. I reside at Ottawa, Illinois, and am now and ever since June 1, 1917, have been State Fire Marshal of Illinois and am temporarily residing in Springfield. It is a part of my duty as fire marshal to investigate fires, regulate storage of oil, erection of fire escapes and enforce the Red Can law. I am a member of the Fire Marshals' Association of North America, which consists of all of the State Fire Marshals of North America, including the United States and Canada. I have been Secretary of that organization for two years and president for one year. I was president of the National Firemen's Association for two years, relinquishing that position in May of this year. I am a member of the International Fire Engineers and a member of the National Fire Protection Association. The purpose of each of these organizations is to study fire hazards and to consider and improve them. In

1919 the legislature of Illinois passed a law giving the Department of Trade and Commerce, of which the Fire Marshal's department is a division, the right to make rules and regulations for the storing of volatile oils. After that I visited practically all of the leading cities of the United States for the purpose of studying the storage of oil. Previous to that my first experience with the storage of petroleum products was back in 1892 or 1893.

Then over this objection of the defendants "We object as no proper foundation laid, the witness not having delineated any facts showing that he is capable of having an opinion of that kind, incompetent, irrelevant and immaterial" the witness testified that in his opinion the storage of petroleum products underground presented a greater hazard from the standpoint of the public safety than such storage above ground for the reason that we cannot detect leaks on underground storage. I apply that to what might be known as bulk storage, meaning the storage of these products in quantities above five thousand gallons. A leak under the ground from storage is liable to seep through the earth getting away from where the tanks are located especially in cities, getting into sewers and basements adjoining the storage, thereby causing hazards, a number of which I have investigated myself.

[fol. 171] Q. Just relate the incidents referred to?

A. One was at Fairfield, Illinois, a few years ago, where an underground tank sprung a leak unbeknownst to the——

Mr. Bennett: I would like to ask the witness a preliminary question or two. Are you giving this testimony of your own knowledge or from the investigation by you as an officer?

A. As an officer.

Mr. Bennett: And you are giving your findings as an officer?

A. Yes, sir.

Mr. Bennett: We object as incompetent, irrelevant and immaterial, not the best evidence.

The Master: Overruled.

Mr. Bennett: Note our exception.

Q. Proceed?

A. At Fairfield, Illinois, where a tank was buried and unbeknownst to the custodians of the plant had sprung a leak. The fumes went through the ground and finally got into the sewer. The tank and plant was located on the outskirts of the city and on a hill. The city proper or the business portion of the city was possibly the lowest point in and about the city. One evening a number of men were sitting in front of the hotel and one of the men, lighting his cigar, threw his lighted match into the manhole which was close by. An explosion occurred, raising the manhole some 75 or 100 feet in the air. The city officials asked that an investigation be made and upon investigation we found that the leak had sprung from the gasoline tank and that the gasoline fumes had got into the sewer and seeking the lower level had landed in the manhole.

The tank from which it escaped was a distance of five or six hundred feet. A report came to the office that at Gaselsburg, Illinois, gasoline was being pumped from a well or what they thought was gasoline at that time at an old livery stable stable in the heart of the city. We made an investigation of it and there was gasoline in the well. We visited all of the adjoining storage filling stations and also one bulk station. They assured us that they noticed no leak from the tanks by measurement. We finally determined that the oldest tank was the one. It was a bulk storage tank and we asked that that tank be raised for the purpose of investigation. When it was raised we found a leak [fol. 172] in the bottom and after the tank was abandoned, we found no more gasoline in the well. The well was between 250 and 300 feet from the tank. My first experience was back in 1892 when I was connected with a brick company. We were using crude oil for burning brick. The tank was buried out in the yard some 200 feet from the tank. The tanks were buried and along the side was a switch track which was lower than the place where the tanks were buried. We noticed a seepage of oil for several days but owing to rush of business it was neglected for a little while, and within a week or two from the time we noticed the first seepage, the entire tank collapsed. We found that the corrosion had weakened the tank so that the top fell in. The soil caused that corrision and there were cinders

around in there. The tank had been buried between four and five years.

Q. Now, Mr. Gamber, state the relative hazard from the standpoint of public safety, of gasoline and kerosene stored in above ground tanks, properly ventilated, and the ordinary dwelling house and grocery stores and clothing stores and others?

Mr. Bennett: We object as calling for a comparison.

Q. Your opinion as to the relative hazard?

Mr. Bennett: And no proper foundation laid.
The Master: Overruled.
Mr. Bennett: Note our exception.

The witness then stated that as an official he insisted upon above ground storage in bulk stations; that gasoline stored above ground with the ordinary precautions is much safer than any structure that you can put up; as safe as or safer than any other so far as the destruction of the tanks and contents is concerned; that above ground storage with proper safeguards is just as safe as any mercantile plant that you might have there; that a tank properly equipped with the safety devices or vents is not as dangerous should it catch on fire as a building to the surrounding property.

Mr. Colmery: Defendants move to strike out all the testimony of the witness relative to the comparative hazard of gasoline stored above ground and dwellings as constituting no basis in fact for the contention that the ordinance complained of is unnecessary.

[fol. 173] The Master: Overruled.

Mr. Colmery: Exception.

Cross-examination:

I have not frequently heard of groceries or residences exploding and being moved from its location to any other location and that would be practically impossible for a residence or any other business or any mercantile establishment. It would not be possible for one of these bulk storage tanks either not if it was equipped with vents and safeguards. My testimony supposes that the vents will work. I would not say that anything might happen if they did not work. I have not had a similar case of that kind in

Illinois but it might be possible if the vents did not work. The only connection between the National Fire Protective Association and the National Board of Fire Underwriters is that the latter finances and pays the expenses of the former. It is supposed to be independent but the connection is as indicated. They are interlocking organizations. My opinion as to the relative hazard of underground and above ground storage does not in all things coincide with the Underwriters. I do not know that they recommend underground storage as safer than above ground; they do not. They have suggested ordinances where they recommend certain things. Now in order to make my answer clear—I attended a meeting of the National Fire Protective Association at Atlantic City in May last when there was a full discussion of a remodeling of the proposed ordinance recommended by the National Board of Fire Underwriters, which is the same as that by the N. F. P. A. and in that recommendation they are asking to reduce the distance for bulk storage tanks or gasoline, kerosene and fuel oil for above ground storage from what the present rules provide. They made no recommendation for reducing the distance for underground storage. The only objection to it was by the gentlemen representing the Rating Bureau, among them a Mr. Parker, I think he was from Kentucky. There were several members of the Rating Bureau that raised an objection to the reducing of the limits. Owing to the rules of the N. F. P. A. where an objection is made it is necessary to go over for another year or until the next annual meeting. An objection was raised to the reducing of the present space which was the recommendation made—that is, that it be for the adjoining property twice the diameter of the tank, which would reduce it half. That argument was all regarding above ground storage. I am not familiar [fol. 174] with the bulletins and manuals put out by the Western Acturial Bureau or the instructions for fire rates. Not having any basic rate or any rating bureau controlled by the state of Illinois I do not know what the relative insurance rate premium rate on above ground tanks and under ground tanks is. At the present time we have no institutions in Illinois fixing the rates except the insurance companies and their own organizations. The Western Acturial Bureau is an organization of the insurance inter-

ests to fix rates of insurance in the western territory. It is also a part of the National Board of Fire Underwriters interlocking with that Board. They draw their pay generally from the National Board. For the reason that we have no rate making body in the state of Illinois and have not a basic rate established there, I am familiar in only a general way with the basis upon which insurance rates are fixed. The insurance companies make their own rates. There is no regulation imposed on them in the state of Illinois at the present time, that is, as to ratemaking. The National Board of Fire Underwriters and the Western Acturial Bureau and the National Fire Protective Association are, to a certain extent, regarded as authority in this particular field. The members of the Fire Protective Association, N. B. F. A. are mostly presidents of fire insurance companies—a few others. The heads of insurance departments are as a rule members but I cannot say that they are always interested in reducing fire hazards and losses, and I could not say that the insurance companies want to make a lot of fires. The insurance companies are interested in the National Protective Association to prevent fire hazards, and that Association exists for the elimination of fire hazards. I do not know what the American Institute of . . . . . is. I know that there is such an organization, the American Institute of Consulting Engineers. I have no knowledge as to whether these two organizations are members of the National Fire Protective Association. I cannot say as to every organization but as a rule a great number of the societies of engineers, inspection bureaus, rating bureaus, underwriters' associations, fire marshals and others connected with the building industry and fire and fire hazards are members of that association. The National Association of Electrical Inspectors is a member. The secretary of that association—of the Western Association—is in the employ of the National Board of Fire Underwriters. The Underwriters Laboratory is an organization fostered by the fire insurance companies. Every fire insurance company that is a member of the National [fol. 175] Board of Fire Underwriters has one certificate of stock in the Underwriters Laboratory. Its function is the testing of materials to see whether they are safe from fire.

Their findings are authority or so regarded with the exception that an appeal might be taken to the Bureau of Standards at Washington. It is an impartial organization. Their findings are supposed to be impartial, but I do not want to express an opinion as to whether or not my experience with them has been that they do view things impartially. As a rule, a great number of manufacturers of explosives and the bureau of explosives are also members of the N. F. P. A. It is pretty broad and is composed of practically everybody in the country engaged in that line of industry. A great many of them are members. I stated that I visited all of the leading cities when making a study of the storage of oil but I was not at Marysville. I had not heard of Marysville until I came here and do not know anything about the local conditions there. The tank at Fairfield, Illinois, was a regular steel gasoline tank from 3/16th to 1/4th of an inch, I do not know which. I did not open it. It was coated with asphalt. I do not know how long it had been there. I made an investigation to ascertain the leakage but I do not recall the length of time the tank had been in the ground but the records we have in Illinois may show it. The tanks were on a hill fifty or seventy-five feet above the town and five or six hundred feet away. A leak developed in the tank around the fittings at the bottom of the tank. They took gasoline from that tank by gravity down to the filling station. The tank proper did not develop any leak. It was in the fittings. If it had been above ground that leak about the fittings would have been discovered before it could have leaked into the sewer. If the contents of the tank had been drawn out through the top there would not have been any fittings at the bottom and the leak might not have occurred. The fumes got into the sewer and flowed to a lower level and there was an explosion. I did not say there was a hernia in the sewer; I said it lifted the manhole. I regard this loose vapor from the gasoline as dangerous. Gasoline fumes, especially confined, are always dangerous and they seek a lower level. If a match is dropped into a tank that had contained gasoline it would be as dangerous as a full tank. The sewer I referred to was tile as near as I know but I did not crawl into it. It was used as both a storm and a sanitary sewer. It took the surface water from the streets as well as the

sewage from the homes. I am familiar only in a general [fol. 176] way with sewer construction and am not prepared to say that it is proper practice to run storm water and sewage together. In smaller towns, however, they are together. I do not think Marysville is very large. The tank at Galesburg was an underground steel gasoline tank 3/16ths of an inch of, I think, ten thousand gallons, between eight and ten. The leak in it developed at the seam which was riveted. The gasoline escaped and found its way into a well some 250 or 300 feet away. The ground was level in that part of the city. The soil was black loam with some light clay. I do not know exactly. We could not state at what point the gasoline got into the well which was a shallow well measuring, I believe, between twenty and twenty-five feet—I want to correct that. We did determine that the gasoline got into it between eight and ten feet from the top of the well. It might have been twelve feet. The tank of crude at the brick plant was buried on what we might say was made ground. There was formerly a swamp around there and where the tank was buried we had filled it in. It was at Brickton, Illinois, about three and one-half or four miles west of Ottawa. It was in 1892 or '3 when I was employed at the plant. I have had considerable experience. Was connected with the brick plant for a number of years and in that construction. Prior to that I was connected with a hardware firm where we did plumbing and steam fitting. Just before I became Fire Marshal I was for two years assistant manager of Frank Lowden's campaign for governor. The tank at Brickton was of steel, possibly three-sixteenths. I would not say because corrosion had been so great there that it had become pretty thin. The tank caved in. There had been a seepage out to the track that must have been from the side of the tank. The tank was completely buried and I understand had been there for four and one-half or five years. I do not know what safeguards were taken when it was buried. There had been a coating of something on there but I do not know what. No, I have never had any experience with fires in above ground storage tanks. To be honest with you, in my eight years' experience as fire marshal, we have not had an above ground storage tank fire in Illinois that was brought to my attention and they are supposed to report all fires within seven

days after the occurrence. I heard of one at Hays, either Hays or Parsons, some little place.

Redirect examination:

Q. How many above ground storage tanks are there in Illinois, give an estimate of it?

[fol. 177] A. There are thousands of them.

Q. Did you ever have any experience with explosion of the dust in a mill?

Mr. Bennett: We object as asking for something not within the issues.

The Master: Overruled.

A. Yes, we have had several.

We had an explosion of dust several years ago in the northwestern elevator where six men were killed and one last January in Pekin, Illinois, where forty-two men were killed.

Recross-examination:

Six were killed in the first one. The northwestern was supposed to have been the latest thing in construction. It was of concrete construction throughout and it was merely the dust that in some way or other, either by a short in the extension cord wire or the breaking of an electric light bulb that ignited the dust while they were cleaning up. It was the very latest thing in safe construction. The only suggestion that I could make there and we did make it in our report was that the dust should be removed in moving the grain from the cars into the elevator but under the state and federal laws they are unable to put that in practice. The elevator itself was constructed in the best possible way but in spite of that an explosion resulted. I have never been an employe of the Standard Oil Company, or the Sinclair Oil Company and I have no arrangement whatever for getting compensation for my testimony here. My only interest in the thing is to try to establish a standard of safety throughout the United States that we would look to as a standard which all states would adopt. I am opposed to underground storage and am discouraging it in Illinois and I have appeared before the councils of several cities where they had adopted ordinances like this.

Q. You have ordinances requiring underground storage in the State of Illinois——

A. We had several and I——

Mr. Bennett: Now, we object to what he did, as volunteered——

The Master: Answer.

A. We had several. They were called to my attention and I appeared before the council and gave them the rea- [fol. 178] sons why underground storage was hazardous and asked them to change it and they have made the changes and are building above ground rather than underground.

Q. But you have——

A. I do not know of any ordinance of that nature.

The reason I do not feel the same way about filling stations is that the quantity that is stored there is so small and their tanks are emptied so often that leakage can easily be detected. The filling stations have been put in so recently that we have not had very much experience with them as to corrosion. In the old sidewalk pumps which are being abandoned, we find the tanks corroded and in a short time would have been dangerous. We recommend that tanks in drive in filling stations be buried because they are only one thousand gallons and I want them buried for the protection of the condition that might exist around a filling station where we cannot properly safeguard the tank from automobiles that might come in—anything that might happen where the human element might cause same—some fellow careless around the place. I did not say that I am recommending that tanks around filling stations be placed underground. In cities under the law of Illinois we are trying to enforce home rule and let the cities enforce and provide their own ordinances. I have not any objection to the plan but under the law we have concurrent jurisdiction with the cities. Ordinarily I think cities are good judges of local conditions but not always. That is occasioned by the lack of experience of city officials. I did not say that my opinion is best and after mine that their opinion is best. We have concurrent jurisdiction with cities in Illinois and for that reason I appear and ask them to change their regulations for bulk storage. As a rule on account of the lack of ground and space they bury the tanks at filling stations.

If they were above ground they would take a great deal more ground to store them. The careless person who comes around with a match or cigaret is not limited to Illinois. A cigaret is a hazard in any kind of a building, even in a fireproof building with a carpet.

JAMES W. CAMPBELL, called as a witness for the plaintiffs, testified as follows:

(Trans. of Ev., Vol. 1, pp. 193-218)

My name is James W. Campbell, reside at Wichita, Kansas. Am a fire insurance engineer and have been connected in that capacity with The Wheeler Kelly Hagny Company for six and one-half years, with the exception of eight months intervening. The Wheeler Kelly Hagny Company [fol. 179] is engaged in the insurance business and as such insures oil properties. From the first of January, 1923, to the first of January, 1924, the face values of the policies on oil properties written by that office was approximately $81,000,000.00. The properties thus insured by our agency have been in Kansas, Oklahoma, Texas, Missouri, Arkansas and Colorado. Before I became connected with The Wheeler Kelly Hagny Company, I was inspector for the Kansas Inspection Bureau making estimates of Kansas insurance rates. Previous to that time I was doing the same thing in Indiana and before that in Missouri. The rating bureaus publish or estimate the fire insurance rates on various kinds of property and use as a rule or measure schedules established principally by the Western Actuarial Bureau of Chicago. These rates are made in the state of Kansas subject to the supervision of the state authorities and the schedules must be filed with them before they are used. As before stated, I was connected with that department and engaged in that business in Indiana, Missouri and Kansas before I assumed my present duties as insurance engineer for The Wheeler Kelly Hagny Company, which duties are much the same as they were in my said former position, except that I now attempt to anticipate the rates that will be established by the officials' estimate. I also make fire protection inspection of fires of all kinds and am

available for advice and suggestions when property owners or customers contemplate building or changing their property. My experience with the hazard of oil and my investigation of oil as an insurance hazard or as a hazard to public safety is in part as follows: About 1914 I was with the Kansas Inspection Bureau and the oil business in Kansas was becoming quite extensive. There were several plants before that but the oil development in the fields was growing into quite some proportions and the fire insurance companies were curious—they had no statistics as to losses and values—and they were becoming interested in the insurance and fire losses of oil properties so it was deemed best to appoint an inspector and specialist in the oil business and I was appointed to that task for the Kansas Inspection Bureau. Pursuant to that assignment I inspected practically all oil refineries and then for the next three or four years, I spent practically all of my time in the inspection and rating of oil properties and operations. In doing that I can say that I have seen personally and examined practically every oil tank in every refinery in the state of Kansas. I have actually been on and in them, and at least one-half of my time now is devoted to similar pursuits. I have an opinion as to the relative hazard of gasoline and [fol. 180] kerosene stored above ground as compared to the underground storage.

Then, over the objection of the defendants "as no proper foundation laid, attempt to usurp the powers of the Master," the witness testified in substance as follows:

I consider tanks of gasoline and kerosene stored above ground as considerably safer from a fire standpoint than similar tanks under ground. The fundamental reason that I say that is because of the fact that there are so few underground tanks in the territory. Last week I went to Oklahoma and went through a refinery and they had five or six underground tanks and they used them for slop and water. I know that two of the five tanks in this refinery had been used for the storage of valuable oils and are now used for the storage of slop. For a period of eight months I was in the employ of the National Oil Company at Arkansas City. They have a small tank that some years before had been used for gasoline and it was changed from that to the use of slop and water. I have been in that tank

and know why it was changed. You could stick your hand through the sides. It had eaten entirely away in places; the bottom had disappeared. I have a fear of an underground tank unless it is of small capacity for the reason that fires can be easily started in a tank with its outlet and filling vent at the surface rather than when above the ground, as ordinary tanks are. In construction of a five thousand gallon tank or larger, and most desirable tanks are eight thousand gallons or larger, it is mandatory to have a manhole. The closing of the manhole in an underground tank is desirable to keep it free from action of trespassers. I have in mind an underground tank of about three hundred barrels' capacity used for storage of wax distillate and I mention this because I know of no underground tanks used for the storage of gasoline at a bulk station but to use that as an example. It has a manhole cover to get down in and I would very much dread to have the tank filled with gasoline because of the pocket about three feet from the top of the dome to the level of the ground. Above it you would have a metal cover at the ground level sufficiently heavy for automobiles to run over and the cover extending down below the ground leaving a bow this high and this wide (indicating) which would certainly be full of gases. In my opinion the possibility of fire spreading from a frame mercantile building is greater than fire spreading from a storage gasoline tank above ground, and that opinion is reflected in insurance rates. Practically all mercantile buildings take a higher rate than above ground storage.

[fol. 181] Q. And within your experience, Mr. Campbell, have there been many fires and disasters from such above ground storage?

Mr. Bennett: We object as too indefinite.

The Master: Overruled, answer the question.

A. I can call to mind no fires in gasoline tanks in my experience. I have heard and read of some but none have been in my territory that I know of.

Fires in dry goods and grocery stores occur constantly. We had 569 runs for the fire department in Wichita last year, none of which were to oil tanks. I have an opinion

as to the relative hazard from the standpoint of the public safety from gasoline and kerosene stored in above ground storage, above the ground, as compared with the hazard of tanks containing 500 gallons or less of crude oil sitting within from two to ten feet of a residence, that is a gasoline tank of above five thousand gallons.

Then over the objection of the defendants "based upon a hypothesis not in evidence, the witness not being qualified to answer, there is no testimony that" the witness testified substantially as follows:

Above five thousand gallons at a distributing station, a comparison between that and a five hundred gallons or less tank containing crude oil and kerosene is all in favor of the gasoline tank at the distributing station. There is no question about that. The first thing in determining that is the familiarity with the product and the ease with which it is handled at the distributing station and the other way round, the ignorance of the product at the dwelling; but crude oil is so much more dangerous than gasoline from all features of fire hazard that the putting of oil against dwelling houses is a very great menace. It gives off vapors called wild vapors that are highly inflammable and will travel from the tank even further than the ordinary gasoline vapors so that the possibility of the passing traffic or burning of gas in the house or many other things of setting fire to these vapors constitutes a very serious menace to the house.

In making schedules for fire insurance rates frequently classes of busines are established of which the oil business is one. The insurance company figures that the rates should be started at an approximate figure for all businesses and then make charges on some businesses and reductions on others. In the case of distributing stations [fol. 182] they have established a basic rate of 75 cents and charges are made for the lack of "No Smoking" signs of ten cents, but practically all distributing stations have those smoking signs. They give a fifteen cent credit for the carrying of insurance to ninety per cent of its value. That would bring the rate down and in underground storage the schedule provides a credit of fifty cents from the final rate of the tank. I know of no underground storage of gasoline at distributing stations and during the last

week I investigated in company with an authority from Chicago the reason for giving the fifty per cent and he knew of no reason why—I know of no reason why underground storage tanks should be given a fifty per cent reduction in the fire insurance rate. It has been carried that way from the first rate. It is based on ignorance I think. The underground tanks have a lower rate and that is, in my opinion, due to the ignorance of those who originated the schedule because underground storage is really more hazardous than above ground.

Q. How does storage in distributing stations of gasoline and kerosene in quantities of 5,000 gallons or more above ground affect the hazard from fire and public safety of the surrounding property as compared to other risks like residences, grocery stores, etc.?

Mr. Bennett: We object as calling for a comparison. Incompetent, irrelevant and immaterial, not within the issues of the case, calling for an opinion which the witness hasn't shown himself competent to answer.

The Master: Overruled.

Mr. Bennett: Exception.

A. I can—in my opinion the danger of fire spreading from tanks or from buildings is—there is a greater danger of fire spreading from the buildings, especially frame buildings, than there is from tanks above ground containing gasoline.

We have tables to estimate the exposure from buildings and this percentage expires at fifty feet from such oil tanks as we have at distributing stations up to fifty thousand gallons. We make no additional charge but this limit is sixty feet, from the ordinary frame building. If the frame building is of large size, the distance would be one hundred feet.

Cross-examination:

A fire insurance engineer is primarily a man familiar with existing fire insurance rating. I am a graduate of the [fol. 183] school of experience. The only school which teaches my line is the Armour Institute and that was not in existence when I was studying. My title of engineer is not exactly self-assumed as Colonel or Professor is as-

sumed by auctioneers. I sell no insurance but the company I am with is in the insurance business at Wichita. The Standard Oil Company is not a client of ours, neither is Sinclair. I was with the Kansas Inspection Bureau about four years, 1914 to 1918, I believe. W. C. Hodges of Topeka is in charge of that bureau. I do not know exactly the arrangements but would answer that that institution gets figures and instructions on rates from the Western Actuarial Bureau, of Chicago, which is in charge of J. D. Parker, the manager, that is an actuarial bureau and makes schedules for application of rates. I am an actuary myself but I never work with them. I do not know what their connection is with the Kansas Inspection Bureau or the Bureau with them. In making up a rate on any given structure I would determine the record of that class of property in respect to values and losses and would then compare with that the existing rates on other classes of property, and on that information I would make the rate. I presume that is the way the Western Actuarial Bureau does. I think of no other way in which rates are arrived at. My rates would be based on the probability of there being a fire. An increase or [or] lowering of the rate would indicate that the class as a whole had been profitable to the insurance company; that the divergence between premium received and losses paid were in its favor. They might have more fires and yet the total loss be lower. It does not necessarily follow that wherever there is a fire there is apt to be a loss. It does not indicate anything regard- two structures where there are two rates, one a dollar and the other fifty cents on two given structures but in classes the fifty cent class is a class that is more profitable and the insurance companies have paid out less in losses. They have some twenty-five or thirty different schedules in the manual which is now in use in the state of Kansas and throughout the United States and states where the Western Actuarial Bureau works is accepted as authority and I would answer yes to the best of my knowledge they have a manual relating to oil ditributing stations. The document handed to me is the schedule used in the State of Kansas for distributing stations now and since December, 1921—it might have been some months later.

The defendants then introduced in evidence Exhibit G.

[fol. 184] (NOTE.—The clerk will here insert the exhibit just referred to or photograph thereof.)

This refers to bulk stations at towns from which tank wagons are filled. Tanks like those of the Sinclair and Standard at Marysville. This schedule provides that if a tank is entirely covered with at least eighteen inches of earth that the final rate is reduced one-half. The rate depends on the kind of property there is there. The computing of rates on buildings is very intricate, detailed problems, and the computing of fire insurance rates on oil tanks is a very simple problem. I could not compute here the rate on the structure shown on Block 40 as a Standard Oil Company property but I can if you can give me a description of that property. I could figure out the rate then. I did not say that the Western Actuarial Bureau based its rates on ignorance. I said that the giving of a credit of fifty per cent for the burial of oil tanks was—I might have said that that was based on ignorance. It was not based on competent knowledge and understanding of the facts. The Western Actuarial Bureau knew about my opinion. This point had never been brought to their attention. I think it would be my duty to do that and that is my intention. I testified that there were more fires in grocery stores than in oil tanks. I have no idea what the proportion or ratio between grocery stores and bulk storage tanks is. The Wichita fire department made 659 runs all together and I should say that there are about ten distributing stations in Wichita, about ten thousand dwelling houses. Out of ten thousand dwelling houses 659 caught fire and out of ten oil stations they did not catch fire. I did not necessarily draw the conclusion that the oil stations won't even burn, but I get from it that the hazard is very slight. In the proportion that you give you could call it a billion to one. That is the experience in Wichita. I am not in a position to have the statistics gathered properly on that. I have methods of communicating with people who have statistics. I have made schedules. Nobody ever had occasion to accuse me of being an actuary and I did not take the dictionary and find out what that

was and decide that I was one. I made a complete inspection of the city of Marysville but did not rate the tanks involved in this suit. The rating of distributing station tanks in any town for corporations such as the Standard Oil Company is seldom ever done. The insurance companies have no fear whatsoever of any danger from these tanks and unless they are in such close proximity to other property, the inspectors ignore them entirely. I think they [fol. 185] are not rated. I do not know if that is true, however. All I know about the number of tanks at the Standard Oil station there is what I heard in the testimony here. I think there is greater danger in a house getting afire and setting fire to the oil tank. I think the likelihood of fire starting is greater in the house than in the oil tank. There is the danger of the human equation and fires in stoves are usually the cause. Directly or indirectly the human element is the cause of most fires and wherever that is present the danger of fire is also present almost in direct proportion to the number of people in the place. The danger of fire in an oil distributing plant would come from—you can have fires in oil distributing stations from grass fires, trespassers or passers by, or possibly, which is the human element again, of cigarets and matches and sparks, railroad trains. You can have it from the tank wagon catching afire. This applies to oil tanks above and below ground. The principal fires in tank stations, I believe, have been from tank wagons where the oil was spread over the ground. That is one of the principal reasons that I have against the underground tank. The fire is burning on the ground and would have easier access to the underground than the above ground tank. My statement is not true if the tank has no outside opening. If it has outside openings it has the greater possibility of catching fire. If there have been experiments with straw piled on top of tanks underground they did not have manholes in the top of the ground if it did not burn. They have had the vent openings and filler openings but no manhole. I do not believe it is possible to bury a ten thousand gallon tank underground and make it safe from fire. I know there have been tests made of underground tanks at small filling station tanks where fire has been put above them. I read accounts of them which are authentic. I have no

recollection of the details of the test. I know a fire has been built on top of the ground and a gasoline tank underneath and the fire burned itself out and had no effect on the buried tank. I think one ten thousand gallon underground tank is all I have seen in my lifetime, one at Coffeyville, Kansas—it was a twenty-five thousand barrel tank. The other is at Arkansas City, I believe. It was a five hundred barrel tank. That would be about twenty thousand gallons. That is the extent of my experience with underground tanks of over ten thousand gallons. My testimony as an expert is based on the fact that I have been in every plant in Kansas and Oklahoma and I never saw but that many, and since I never saw any more it is probably not a good thing. I am familiar with the National [fol. 186] Board of Fire writers' specifications for underground storage. It recognizes the fact that there are both classes. I would say as to the truth or falsity of a statement. "Those storage systems in the largest sizes are such as are generally found in oil fields, refineries and oil distributing stations and consist of tanks located above ground. The hazards of such system depend upon the distance from burnable property and topography of the surrounding land, but owing to the tanks being above ground they are considered as more hazardous than underground systems of storage." I read that from the Regulations of the National Board of Fire Underwriters for the installation of contain-rs for Hazardous Liquids recommended by the National Fire Protection Association. If it is based on a—The statement classes refineries and distributing stations in the same class. The use and size of tanks at distributing stations cannot be compared with refineries. As to whether or not the statement is true or false I would say that it is an unfair question. It is incorrect. The National Board of Fire Underwriters is an organization of fire insurance men. I am not absolutely certain of that but that is my opinion. It is maintained for the purpose of reducing fire losses. It makes reports of towns as to the fire protection, suggestions for improvements and makes reports of fires. They are members of the National Fire Protection Association and work with them. They collect statistics of losses and make findings from those statistics. That I think is about the extent of my

knowledge of their work. It covers the entire United States but I do not know the number of people it employs. It employs engineers and experts of all kinds and they investigate matters to which their attention has been called. They won't investigate things not of importance. I do not say from my knowledge of the National Board of Fire Underwriters that they would promulgate a regulation like that without investigating it. That was not a regulation; it was a statement of their opinion. I think that the promulgation of an opinion of that kind with a head including filling station tanks with the other tanks was based on false knowledge. I was with the Wheeler Kelley & Pagny Company at Wichita, Kansas, in 1919 as engineer and actuary. I had no occasion to investigate a fire at a distributing station at Hays, Kansas, only through the newspapers and trade journals. I should not have said that I did not know of any fires at distributing stations; I meant that my tanks have had no fires—in my own territory. I do not know it to be a matter of fact that there have been a good many fires at distributing stations in my territory. [fol. 187] I can call to mind but three during the last six and one half years—no, I will say two. There was no fire in the tank at Cedarvale. At Leavenworth, Kansas and the one at Hays. At Cedarvale while a tank was being filled, a train went by and the station man having completed his job of filling started his car and got out into the yard and the vapor that had run took fire and the building was immediately in flames. The tank wagon caught fire and the gasoline or kerosene from the wagon ran out over the ground and burned the paint from the tank but did not ignite the contents of the tank. The pump house was destroyed. The tank and contents were destroyed at Leavenworth. I never saw a fire at a distributing station. I never have seen one that has been on fire. I read the reports in the newspapers and trade journals of the Hays fire. I stated that a house or grocery store was more likely to take fire than a distributing tank. Yes, I have heard of a grocery store blowing up. We had a grocery store about half way between my home and the office in which a man went in and lit a match and it blew up—blew the walls out. Yes, I have also heard of a residence blowing up. I have a very close friend disfigured for life from an explosion.

The four walls did not blow up, no, sire. They were full of gas. Gas also caused the grocery store to blow up, but it is not just the same perhaps—as the vapors that arise from an oil distributing plant.

Redirect examination:

Q. There is a greater likelihood of a fire starting in a residence than in an above ground tank—which would present, after the fire started, the greater hazard to the public and surrounding property?

Mr. Colmery: We object as incompetent, irrelevant and immaterial, having no bearing on the issues of the case.

The Master: Overruled.

Mr. Colmery: Exception.

A. The greatest fire hazard in modern communities is the shingle roof, speaking for the public welfare, the general community. There is a greater hazard to surrounding property from fire in an ordinary dwelling house than a distributing station, the gasoline tank.

A tank below ground would have to have some opening.

[fol. 188] Recross-examination:

A shingle roof is a greater hazard in a community than a gasoline tank at a distributing station. I never saw a shingle roof looking like defendants' Exhibit F. It could not look like that. From my knowledge of fire, I would say that a dwelling house or a building fifty-eight feet from that would be in serious danger (referring to defendant's Exhibit F). I think it is crude oil. It appears to be more of a crude oil fire. Assuming that it is crude oil burning the house would be in serious danger. This is a very good picture but it is impossible to assume that it is a gasoline fire.

Redirect examination:

A fire of a residence fifty-eight feet from another residence would present necessarily some hazard and if I were in a residence fifty-eight feet from another one, I would be looking out for my interests, or any other kind of a fire.

WILLIAM E. BREWER, called as a witness for the plaintiffs, testified as follows:

(Trans. of Ev., Vol. 1, pp. 218-226)

My name is William E. Brewer. I reside at Carrollton, Missouri. I am with the Empire Pipe Line Company and as such have charge of location and maintenance of the trunk line from Humboldt, Kansas, to Chicago. I have been connected with them since 1917. I have had considerable experience with pipe lines. They are buried eighteen to twenty-four inches deep because they cross farm land and highways and railroad lines and we are required to thus bury them by necessity. Our company has not had a great deal of trouble itself from the fact that the line has not been buried long enough to cause trouble. It was buried seven years ago, but upon examination we found corrosion. We tried to stop it by the use of about twenty different kinds of coating and none have proved successful yet. The parolite coating, asphalt—recently the engineers advised us that the asphalt contains an acid itself which made the remedy worse than the disease. I do not know of any coating or preparation which will prevent underground steel or iron from corrosion. Our company has been experimenting on the question. We find the most serious results from corrosion wherever we encounter acid in the soil. We usually have more trouble on account of cinders because the water going through cinders makes sulphuric acid. The water creates the sulphuric acid—well, I have never analyzed it but that is the effect. It starts very rapid corrosion on [fol. 189] the line. The pipes are subject to a greater degree of corrosion below ground. There you have the soil water. Above ground it would be more easily taken care of. There you only have the air vapor to contend with and it doesn't contain any acid. Water in the soil might pick up acid. The line above ground would be more easily repaired. To repair a line below ground we have to dig it up, elevate it. We commenced to find corrosion in our pipe line three or four years ago.

Then over the objection of the defendant as incompetent, irrelevant and immaterial, and not within the issues of the case, the witness testified:

We have line walkers that travel the line, aim to cover a forty mile strip twice a week and repair any leaks. They find and repair leaks quite often. Any water bearing soil that is gravelly, well, whether the water travels rapidly, oil from leakage under the ground may be carried quite some distance. We have had several damage suits on account of it getting into creeks and wells. We have had a case on account of it destroying fish. We had about three thousand barrels travel down the Missouri River once. It would burn if set on fire.

Cross-examination:

It was an ordinary clay soil, I suppose, that I spoke about oil getting into and I do not know the precise distance away. I did not examine it and all I know about it is that we had claims to adjust. I could not state other specific instances about oil killing fish. I am not connected with that kind of claims. I do not know either when the fish were destroyed. The claim had been brought against us. I do not know what kind of soil produces sulphuric acid—not only sulphuric acid but any kind of acid. We have not had all of our soil analyzed. Soil that causes corrosion is usually found where the cinders are located; the most direct cause seems to be the nature of the soil itself. I do not know just what kind of soil it was. Apparently there is no difference in the soil. You look at it and the soil looks the same but some places the pipe is corroded and others it is not. I am not a geologist and not much of a chemist. I am not acquainted with Kansas. The pipe in our pipe line is just so thick. Now in some places you can lay a quarter of a dollar in holes in the outside and run your hand over it and never touch the quarter. In one case we have to replace three hundred feet of pipe completely. It was gone within three years after it was laid. The pipe I refer to is in Inde-[fol. 190] pendence where drainage from the sewer had eaten it up. It was laid in the river. It was between the banks that the leak occurred. The only case where we have pipe lines above the ground is temporary construction for

a short period. The lines we use for service around the station is kept buried because the temperature changes. The temperature is more uniform under ground. We usually have a leak in our pipe lines laid temporarily above ground. These leaks occur at the joints. The last line we put down was coated with asphalt coating and it was all coated with pipeline paint, a mill coating and a field coating is put on, two coats of black paint. There are pumping stations every forty miles along the pipe lines and I am acquainted with them. The oil from one station is pumped ahead to another station and taken out. The connections of the tank are all below ground. The line discharges into the tank at about two feet above ground and into a manhole opening about a foot above ground. Until now we have kept four feet of soil on top of the connection but now it is left open. I never heard of a leak developing at this place a few feet above ground. There is practically no pressure. It settles into the receiving tank with practically no pressure at all. We put the earth around it and keep it freezing the water in the bottom of the tank. Freezing might block the oil from coming it. It would congeal the oil or water in the bottom of the tank and that might cause a lot of embarrassment. The lines I speak of convey crude oil and as far as I know that is the only material that is transferred in pipe lines from the field to the refinery and the refinery to distributing points except that there are short lines transmitting other classes of oil. The first we experimented with parolite was about three years ago. It has not been in operation long enough for us to know what success we will have with it. The thickness of our wrought iron pipe is approximately three-eighths of an inch. We have different weights, extra heavy and medium. I believe the ordinary line pipe is five-sixteenths or three-eight-s. The five-sixteenths is heavier than the three-eighths. The distance from the pumping station has nothing to do with the size of the pipe. The elevation of the two stations would have more to do with it. Pipe line stations are generally forty miles apart and we use ordinary line pipe except in cases where we expect to have a river crossing and there we want to be on the safe side. We control our pressure by the pipe rather than the pipe by the pressure. The five-sixteenths pipe is generally large enough. I do not

know what the effect of hydrostatic pressure would be on the life of the line and do not know the percentage of regular [fol. 191] hydrostatic pressure of water going through soil. I do not know what creates the acids in the soil but anyhow they corrode. I do not mean to say that acid was carried to it by water except where there was something in the ground to create the acid. It takes rain or moisture of some kind to create that. I do not think that that can be taken care of and the corrosion avoided by proper drainage. I do not know anything about underground storage tanks and that has never been a part of my work. I was county engineer four years ago in Cairo County, Missouri before I took my present position. All of my experience is based upon my work since 1917—all except with the steel.

H. A. Lewis, called as witness on behalf of the plaintiff, testified in substance as follows:

(Trans. of Ev., Vol. 1, pp. 226-232)

My name is H. A. Lewis. I am Assistant Manager of Sales of Standard Oil Company and reside at Chicago. My duties as such assistant manager pertain generally to things connected with the sale and distribution of all of our company's products. Stations like the one at Marysville come under my jurisdiction. I have been in the oil business for twenty-one and one-half years. I entered the employ of the company as a stenographer. From that I became a salesman and from that assistant manager of the division, then manager of the division, and then assistant general manager. I have resided during that experience in Kansas City and Chicago. It was at Kansas City that I commenced my employment with the company and later became manager of the division at Kansas City. When I went to Chicago first I was manager of the Chicago division and at the present time am assistant general manager. During my experience in the oil business, I have had occasion to investigate the manner of keeping and storing oils by distributing stations of my company and all other companies, and during practically all of the experience I have had in the oil business, I

have been giving that matter consideration. It has come up many times. Our company has 12201 storage tanks above ground, 997 of them are in Kansas. Other companies have 2308 of such stations in Kansas—that is outside of ours. I do not know how many other companies have throughout the United States but thousands of them. I know that there is a usual and regular manner recognized and in general use by the oil fraternity generally of storing and keeping gasoline and kerosene at distributing stations.

[fol. 192] Q. You may state what that is?

Mr. Colmery: To which the defendants object as incompetent, irrelevant and immaterial and an attempt to establish a custom, and as not being within the issues of the case not binding on these defendants and constituting no ground for equity nor ground for equitable relief against the defendants.

The Master: Overruled.

Mr. Colmery: Note our exception.

A. It is a generally recognized plan of such installations that they shall be above ground.

Q. And you may state whether in your opinion that method of storing and keeping gasoline and kerosene in these storage tanks is a safe one from the standpoint of the public safety?

Mr. Bennett: We object as incompetent, irrelevant and immaterial, calling for expert testimony and the witness now having been shown as qualified to answer.

The Master: Overruled.

Mr. Bennett: Exception.

A. It is.

That method of keeping and storing gasoline and kerosene has been followed by our company and others ever since I entered the service and I do not know how long before.

Q. Describe these stations to the Master, Mr. Lewis, in a general way, of what they are composed and where they are situated?

Mr. Colmery: We object for the reasons stated and because the evidence is not confined to the city of Marysville and the tanks of the plaintiffs in this cause.

The Master: Overruled.

Mr. Colmery: Exception.

A. These stations are usually constructed adjacent to the railroad right of way, and consist of steel storage tanks, small warehouse and pump house, necessary pipe lines. They rest upon concrete piers. That is a brief explanation.

Q. Have you an opinion as to the relative hazard from the standpoint of the public of storing gasoline and kero- [fol. 193] sene in tanks above ground and—at those stations such as you mentioned, as compared to the safety of storing it under ground?

A. Yes.

Q. State the opinion?

Mr. Colmery: We object as incompetent, irrelevant and immaterial, no proper foundation having been laid and attempting to usurp the province of the Master.

The Master: Give your opinion.

Mr. Colmery: Exception.

A. My opinion is the public welfare is best served by the installation now used.

Mr. Bennett: We move to strike out the answer of the witness as not responsive to the question.

The Master: Overruled.

Mr. Bennett: Note our exception.

I mean that the public welfare is best served by installation of above ground storage. The reason for that is that storage above ground can be properly policed so that any liquid that may leak—any leak that may occur—can be noted and repaired quickly. Our organization has facilities for doing that which consists of various departments that are traveling continuously throughout our territory, such as the salesmen, auditor, manager and pipe line forces. Those are in addition to the local agent. They can see underneath the tank, over them and around them, and any leaks occurring would be fixed, the matter of policing would be impossible if the tank were underneath the surface, and

the underground tank would have to be taken out to be repaired. We have a method of pumping out of the tank any water or any foreign matter through a pitcher pump. Occasionally it is necessary to go into the tank and to ventilate them. I would not be responsible for anybody entering the tank unless it had been properly aired. I know of no way that it could be aired under the ground.

Cross-examination:

I said yes that an underground tank could be repaired by taking it out of the ground. That is not impossible. The pitcher pump would work with equal effectiveness under the ground. It is necessary to go into the tanks and [fol. 194] clean them out but the time of doing so varies, but I should say that it was necessary to go into a tank about once a year. In some instances it is necessary more frequently than that. We have an agent in town at each of these stations and our station at Marysville, Kansas, is like the rest of them. The agent at a station of that kind would appear in the business hours of the morning, make whatever deliveries are necessary, which would take an hour or such matter in town, and then he would probably be in the country the balance of the day. He would be in the city daily to transact what business is necessary there and then go into the country. I do not know exactly what territory our agent at Marysville covered. He probably has a radius of ten or twelve miles. I base my opinion as to the relative hazard of above and underground storage tanks wholly on custom but in addition to that we also have conferences with our research department and mechanical department. My opinion is based on the custom and conferences with these gentlemen mentioned. My company does not have any underground storage in its territory that I know of. My opinion as to the relative hazard of above and below ground storage is based largely on advices we get from the people who make a study of that matter. It is not only conjecture; it is based on scientific research.

C. H. Wagner, being recalled for further cross-examination by the defendant, testified as follows:

(Trans. of Ev., Vol. 1, p. 232)

Our company stores at Marysville gasoline and kerosene but no crude oil, benzine, naphtha, distillate, lubricating oil or any other inflammable liquid.

III

Evidence Presented by Defendants

C. F. Travelute, a witness called by the defendants, testified:

(Transcript of Testimony, pp. 235-262)

Direct examination.

By Mr. Bennett:

My name is C. F. Travelute; residence Marysville, Kansas; I am mayor of that city and one of the defendants in these cases. Have resided in Marysville about 54 years; I have been Secretary of the Chamber of Commerce and [fol. 195] manager of the Credit Bureau for nearly two years, starting in 1922 and ending in 1924.

The population of Marysville until about July, 1918, was approximately 2,400. The Union Pacific Railroad Company at that time moved its office to Marysville from St. Joseph, the Grand Island Division; they also moved the division point there. The population increased very materially at that time. I think our last report was over 4,200; the increase was largely railroad employes. It has made a scarcity of houses. Certain factories developed, it started a building program which has continued to this day. Our town is of rather peculiar topography. What is commonly called the better class of residences are on the hill and property there is held at a considerably higher price than property in the bottom land. The hill is in the Northeast part of the town, while block 71 is in the Southwest part of town. The price of lots on the hill is much higher than around block 71. On the hill lots are worth perhaps $2,000; adjacent to block 71 they would sell from $500 to $1,000.

There is little vacant property unless you go to extreme parts of the city. A large portion of the unsettled part of the town in the neighborhood of block 71 is so low that it is not available for residence purposes. That is the district lying south of block 71.

Referring to Map, Exhibit A, (indicating), this portion lying within the city limits (Southwest of block 71), marked by a green line, is very low and not available for residence purposes. The green line indicates where it breaks off very suddenly. This part of the ground (indicating) is fairly high and fairly level with a drop of possibly 15 feet. This part was apparently at some time an old creek bed. It overflows and drainage is bad there. One of the principal objections to this district is that the water from the high part of town runs down there and can't get away into the river. The territory other than that (shown by indication) in the vicinity of block 71 is suitable for residence.

Sixth Street has been recently paved as far south as Jackson. Within the last year (1923) we have put in sewers in the part lying west of the railroad. That sewer connects with Elm Street, Walnut Street, Spring Street, Oak Street, Jackson Street and South Street. I can't tell the number of houses that have been built in that vicinity, (block 71.)

This territory (blocks 49, 50, 51, 52) was a ball park prior to 1918. The part of the territory of these four blocks which was the ball park was one block, block 49.

[fol. 196] "Mr. Doran: I object to the question and answer and ask to have the answer stricken out for the reason that the block referred to is not adjacent to or in the fire hazard or in the hazard of the location of the Sinclair Oil Company tanks in Block 71.

"The Master: Overruled.

"Mr. Doran: Note an exception."

There have been at least two houses built in the Southwest part of Block 50. These two houses are in the south half of block 50 on Spring Street, between Fifth and Sixth. I haven't in mind any definite location of further improvements in that vicinity since July, 1918. The residence in the west part of the south half of block 71 has been built (rebuilt) since July, 1918. A storage tank has been in-

stalled underground in the north part of block 71 and sheds erected.

During the time of rank growth of weeds and vegetation (summer-time) in 1923, I found there was a considerable lot of weeds and vegetation around the property of the Sinclair Oil Company. The fence around the Sinclair tanks was not there when I went down and looked at that particular time. To my recollection it was placed there in 1923.

The business street of Marysville is Broadway. The next street south is Elm. It runs east and west. The next is Walnut. The more condensed part of the business section of the city is on Broadway, particularly from Sixth Street east to Tenth Street.

The block between Seventh and Eighth on the south side of Broadway is a tailor shop, a pool hall, a plumber, a barber shop, a garage and a restaurant, a shoe shop and a hardware store and a drug store and a grocery store. The restaurant is three stories. A new building is being constructed back of the tailor shop. Between Sixth and Eighth on the south side of Elm Street, first there is nothing, then a residence, a garage, a service garage, vacant ground and a hotel.

Crossing Elm Street into block 39 we have a residence, in fact, in the east half of the block is three residences, a frame building being used as a furniture store, and there is the railroad right of way.

The main part of the residence district of the town is off in the northwest corner of the city, and the business district runs on Broadway from Sixth to Tenth, you might say to Eleventh and Twelfth.

[fol. 197] When I went down there to investigate, the tanks of the Sinclair Company, in block 71, were much in need of paint; showed indications of rust. There were grass and weeds around these tanks. There were indications of some leakage, there were moisture spots.

Cross-examination.

By Mr. Doran:

I went down to the Sinclair tanks in the summer of 1923, some time during July. The weeds were green. We have a weed ordinance in Marysville. I didn't call the attention of

the company to the weeds, or have them arrested. There were enough weeds to cause a fire but they were green weeds. At that particular time they wouldn't have started one (fire). They didn't become a fire hazard until late in the fall. They removed some of them before they became a fire hazard. I couldn't say they removed all that would cause a fire hazard. That is the condition now, that they have all been removed. Ordinance No. 350 was passed in October, 1923. There weren't any weeds that caused us to pass the ordinance. It wasn't passed on account of the weeds.

I have lived in Marysville ever since the Sinclair Company owned these tanks. I know J. H. Reipen and know he built these Sinclair tanks; the same tanks that are there today. He owned the lot on which they were built. I have been Mayor 3½ years. Have known Block 71 since 1916. The Reipen house was built on the block. It was remodeled—the old house rebuilt. There has not been another residence built there since the Sinclair Company bought it (the property). One shed burned down across the street, on the north side. These houses here were there all the time. The little frame sheds were there; the frame shed that was on the north half of block 71—the west half of the north half—burned down. There has never been any oil fire in the Sinclair grounds. We never had any trouble caused by gasoline or kerosene and oil in that block. The ordinance wasn't passed because of what had happened. All the houses in the block, and the shed, were there at the time the Sinclair Company bought the property, and the only change in that time is the rebuilding of the Reipen house.

The territory lying southwest of block 71 is unfit for residence purposes. There are only two houses down to Jackson Street south of block 71, and those are clear across the street. There is quite a large vacant tract there; there are 60.8 acres in that vacant tract, in the heart of Marysville. [fol. 198] Part of it is on the Blue River. Under the ordinance the company would be prohibited from erecting an oil tank within the limits of the city. There is a vacant tract of 8.61 acres here, not very desirable. I know there is a vacant tract of 5.46 acres right east of the Sinclair Oil Company's plant. There is another vacant territory

over here, on the southeast side of the city of 19.55 acres, unfit for (residence). There is a lagoon or low place in vacant territory southwest (of block 71), all sandy soil, sometimes overflows. In 1903 the territory all around there overflowed.

Cross-examination.

By Mr. Doran:

The business center of Marysville for a great many years has been on Broadway between Sixth and Twelfth Streets. It has been greatly extended in each direction. There have been no houses built south of the Sinclair station in the last 14 years. The Sinclair and Standard Oil tanks have been there for a great many years. The Blue Valley switch was, to the best of my judgment, built there about the time these tanks were constructed. The tanks are just as they have been all these years since they were constructed.

Redirect examination.

By Mr. Bennett:

The main line of the Blue Valley Railroad from Marysville to Manhattan, as I recollect now, was extended a considerable distance from where the switch is now and later abondoned.

Memorandum as to Exhibits "H" and "I"

The city runs three full blocks south of Oak Street. Exhibit H is a picture of the Standard Oil Company plant taken from Seventh Street, looking southwest, and correctly shows the location of the property around the Standard tanks. It was taken last Friday. Exhibit I is a picture of the Standard Oil Company taken from the east side of Seventh Street, looking northwest, taken last Friday.

South, across Walnut Street, a residence is under course of construction. That house is just started: been building approximately two weeks.

At the right hand side of the picture, Exhibit H, behind the tanks, a coal shed is shown. It belongs to the Bone-McLucas Lumber Co. It is shown on the map, Exhibit A.

The residence of J. W. T. Potter is shown in the picture over the top of the coal shed. It is a substantial brick residence of probably eight rooms. There is a small residence [fol. 199] between Potter's house and the coal shed. It is shown in Exhibit I as being directly west of the coal shed, between the coal shed and the Potter residence.

Here the Clerk will insert copies of defendants' Exhibits H and I, introduced in evidence.

That house, to my recollection, has been there at least thirty years. It has been remodeled and some slight changes made in it.

I know from people who have talked with me with reference to building there as to the reasons for not building there.

(This was introduced over the objection of plaintiffs, that the testimony was hearsay. Objection overruled and exception noted. Tr. of Evidence, pp. 255, 256.)

It is because it is a situation in too close proximity to the oil tanks, because of the fear of danger from explosion of oil tanks.

There is an old stone quarry—a vacant tract—8.44 acres, in the north part of the town, comprising block 40, a little north—running a little north from there, that was used for cutting stone for a number of years and is a hillside and is largely not in a condition where it could be used for anything. The plat shown on the map (Exhibit A,) in red, comprising block 37 and designated as containing 19.55 acres is a hillside, and at the bottom of this hill or bluff was the original bed of a creek. That is within the city limits. That is no more the bed of a creek, for the reason that the creek has been changed and there remains a low place and a very rugged hillside. For that reason it has not been built up. Under present conditions it is not suitable for residence. A vacant track of 5.42 acres Southwest from the city part is a part of block 69 and is also part of an original creek bed, and is now pretty low and not in condition to be built upon or occupied. Some of it is now used for truck gardening. The low point is 12 or 15 feet below the railroad track.

Out about 18th and Laramie, 18th and Jenkins, some ground is marked as vacant by red around it; that is what is known as the Redman addition to the city, in the extreme Northwest corner of the town. That is also true of the property lying alongside of the town, north of North Street.

[fol. 200] Recross-examination.

By Mr. Doran:

The vacant tracts mentioned are all within the limits of Marysville and the ordinance regarding the burying of tanks covers it (them).

As I testified, there are only two houses south of block 71. In blocks 80 and 81, south of block 71, there are no houses at all. In the block immediately south the old lagoon or creek bed covers about half of that bluff; it is low land and overflows. It is unfit for residence in its present condition. The drainage has never been taken care of. There are no sewers there.

I am not qualified to say as to what distance a building would have to be away from the tanks to be directly in danger; I am not an expert, can't say that buildings three blocks away would not be in danger. I do not know how far away the house shown in the left of Exhibit I (a picture) is, whether it is nearer the tanks than other buildings. I was referring to the little cottage, it has been there 30 years. It has been there longer than the tanks have. I can't say how long the house shown at the left in the picture has been there. Generally speaking it was there a great many years ago.

Fenwick's buried tanks are close to a residence, don't know that they are less than 20 feet. Probably closer than buildings to the other tanks. I wouldn't give the distance.

Redirect examination.

By Mr. Bennett:

My sense is that a house 58 feet away from one of these oil tanks above ground is a very material hazard. My opinion is that there is a hazard existing to buildings 99 feet away.

Over the objection of defendants, overruled and excepted to, witness stated, I believe there is a very material hazard existing *form* a coal shed 25 to 30 feet away.

Over the objection of the plaintiff the Standard Oil Company, the witness stated, "My observation and knowledge would indicate to me that there is a very substantial danger exists" at the Standard property in proximity to the houses and buildings.

Motion to strike out overruled and excepted to.

E. F. Bowman, a witness called by the defendants, testified:

(Tr. of Testimony, pp. 262-300)

[fols. 201 & 202]

Direct examination.

By Mr. Colmery:

My name is E. F. Bowman, residence Marysville, Kansas. I have been City Engineer of the City of Marysville; relinquished that position about a month ago because the mayor requested me to serve on an Auditorium Board, and the law requires that no member hold any other city position, for that reason I have resigned. Have since been doing work for the city. Have been engaged in engineering profession for 12 or 13 years. Now have charge of the drafting and estimating departments of the Central Division of the Union Pacific Railroad. Have been in that position almost five years. Just previous to that I have been building inspector and engineer for the El Paso Railroad. Prior to that I was river inspector and instrument man for the Atchison, Topeka and Santa Fe Railroad. I had almost a year in the valuation department of the St. Joe and Grand Island Railroad, preparing valuation reports to the government.

Witness was shown map marked Plaintiffs' Ex. H. and stated that it was made by him. It is made from actual

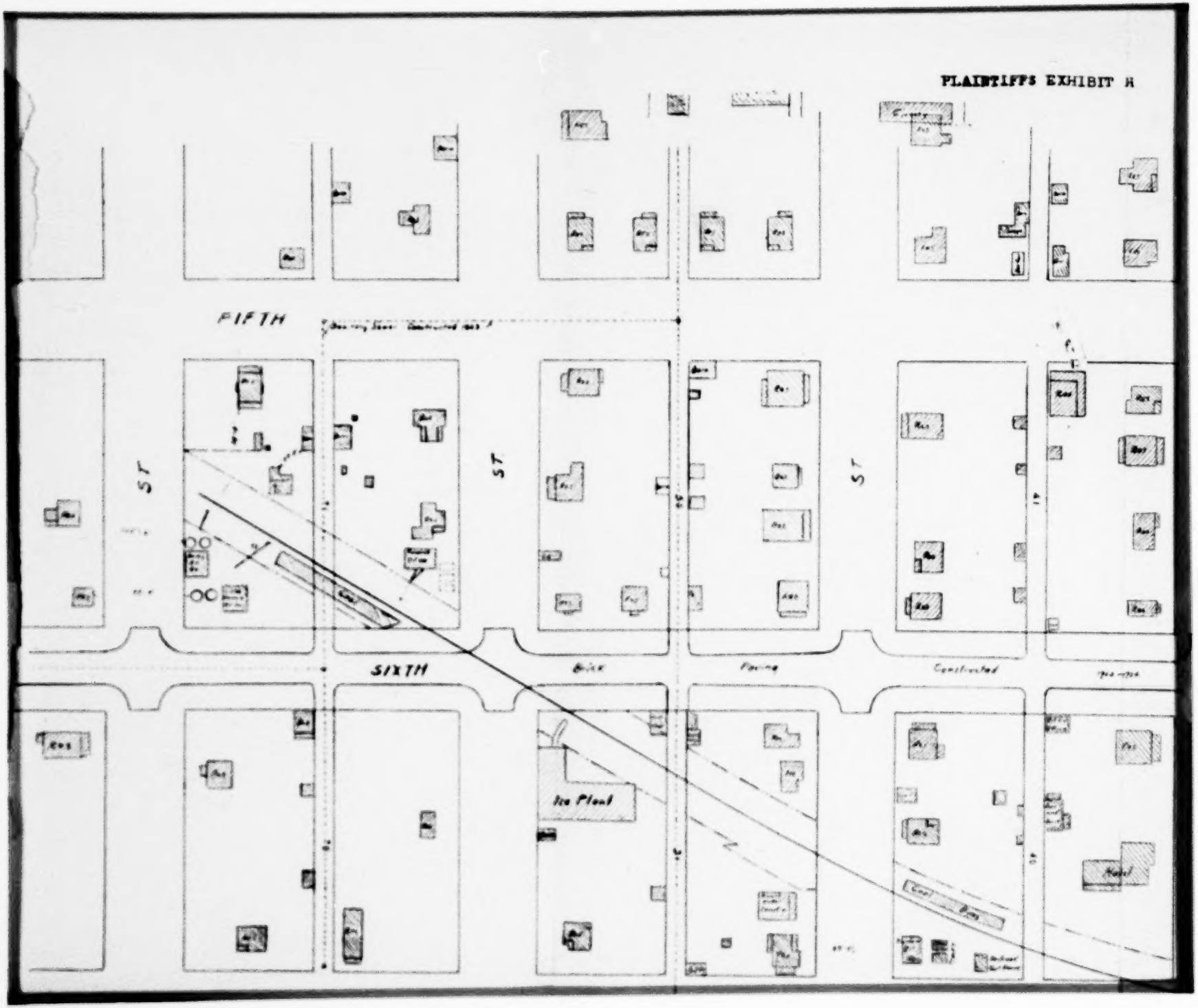
measurements and is substantially correct. Scale is 40 feet to the inch.

(Here follows Exhibit H, marked side folio pages 203 and 204)

[fol. 205] The business district of Marysville comprises blocks 11, 20, 10, 21, 9 and 22, as shown by the map. The business street is Broadway. The Grand Island and Union Pacific are both on here. The Union Pacific track runs north and south on 7th street, enters the city limits on the south and runs up 7th street a block beyond the limits of this drawing. They also have what is called a connection here, also an oil spur which runs southwest from a connection in Seventh street a district between Elm and Broadway. The passenger station is located at Carolina and 7th. The spur that runs to the southwest is the main track of the St. Joseph and Grand Island. The St. Joseph and Grand Island owns a strip fifty feet wide on each side of the track excepting where it is in the public street where its right is covered by an ordinance. The Union Pacific has no right of way on 7th street. The spur track has a minimum right of way of 30 feet on each side excepting where they were required to buy a little extra connection with the 30 feet. The oil spur terminates in block 71, just north of the north line of Oak Street.

The Standard Oil Company's property is located in the southeast corner of block 40; the Sinclair is located just approximately the center of the south half of block 71. Seventh Street runs along the east side of the Standard oil property. The Standard property is bounded on the north by the east and west alley, on the south by Walnut Street. The Sinclair property is bounded on the north by the east and west alley in block 71, on the south by Oak Street, on the east by railroad property, on the west by privately owned property.

Block 21 is immediately north of block 40. Most of the south half of block 21 is city property used for storing street drags and tractors and road machinery. On the property they have one small galvanized iron tool house. On the west side of the south half of that block is a resi-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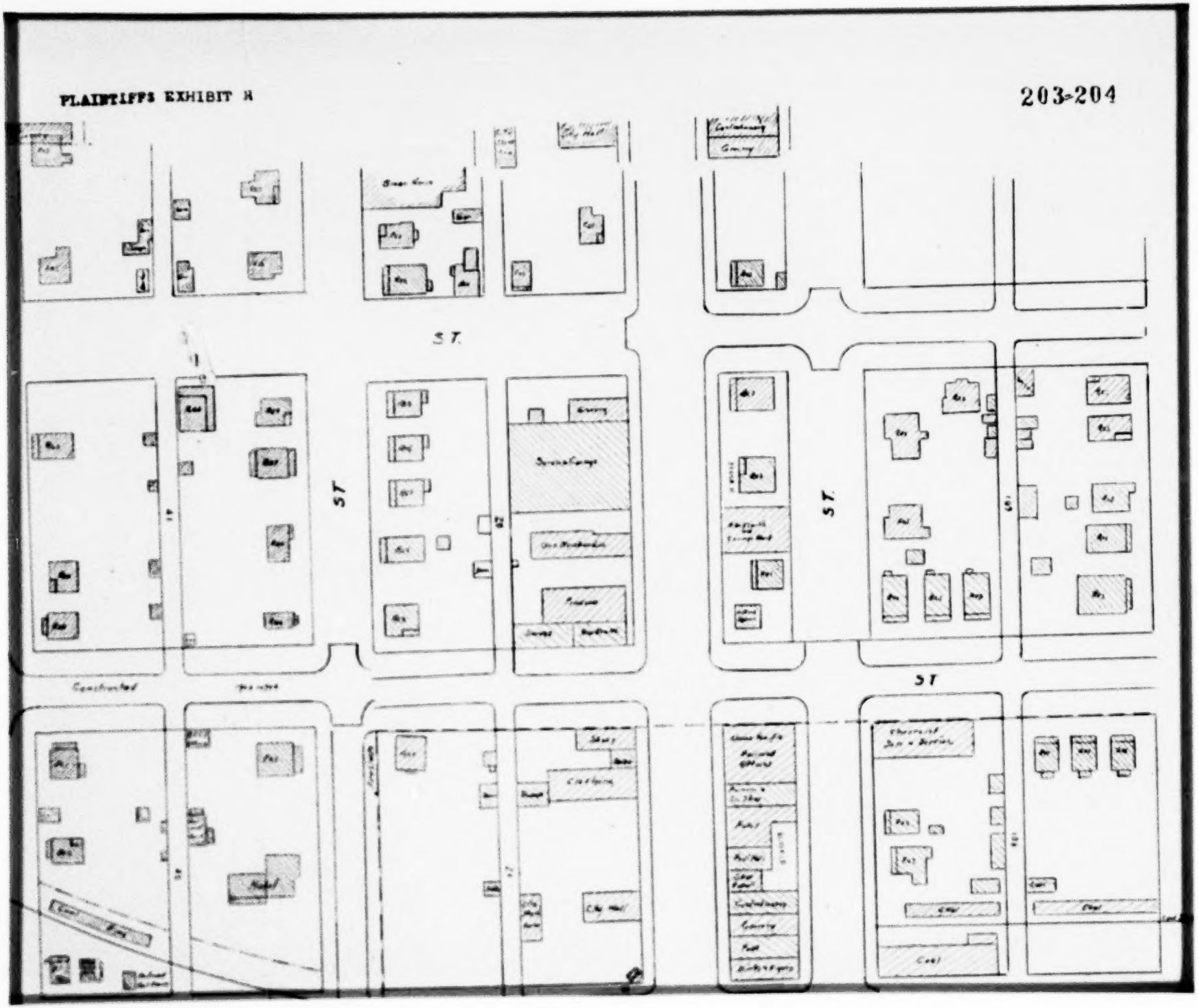
PLAINTIFFS EXHIBIT A

203-204



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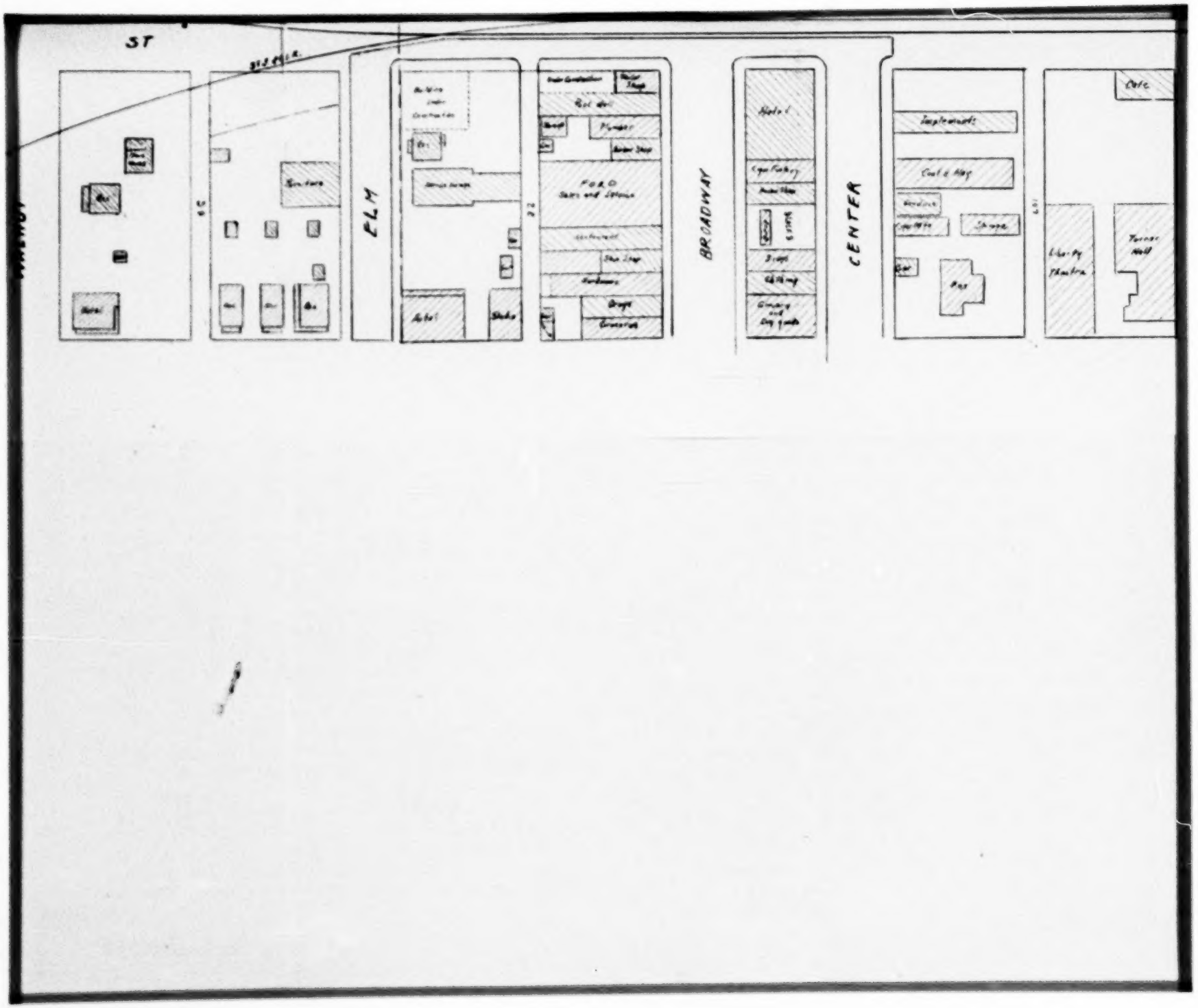
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Drugs
Grocery
Meat Shop
Plumber
Barber Shop
Shoe Shop
Hardware
Bakery
Stable
Cafe

dence which has a barn and several outbuildings, and that is all the improvement on the south half of the block.

The south line of the fire limits is the north line of Elm street. That is to the point where Elm street intersects Sixth street, then the fire limits turn north and the west line of the fire limits and the east side of the fire limits is the west side of 6th street. The fire limits are designated on the map, Ex. H, by a dashed line and by letters "Fire Limits."

Block 22 is directly east of block 21. The south half of block 22 is all business with the exception of a small resi- [fol. 206] dence directly west of a service garage. I don't have any idea what the building under construction in the Southwest corner of block 22 is to be. It is 305 feet from the Standard Oil Company tanks, in block 40. Block 39 lies directly east of block 40, Block 37 (error, should be block 39) is occupied by one business house, a furniture store that fronts on Elm street. There are also three residences facing east on Eighth street, with their outbuildings, and all the improvements on the north half of the block.

The right of way of the St. Joseph and Grand Island takes up a strip 50 feet wide (west side of this block.) There are 6 lots in the north half of the block. The railroad owns a portion of two lots. There are four lots not owned by the railroad company. There are three residences and one business house, a one story furniture store, on the north half of the block. On the south half of block 39 there is at least one third of the south half railroad right of way, and in addition to that there is a hotel located in the southeast corner of the block—a two story building about 35 x 45 feet. It is west of the hotel, is a residence. Northwest of that is a cement block works. That residence is 208 feet from the tanks of the Standard Oil Company.

In the north half of block 40 the railroad owns a strip of ground 30 feet wide. Just west of its track, and immediately west of that is a two or two and one-half story hotel about 40 x 70 feet. In the northwest corner of that block is a residence 32 x 36 feet, and a combined office and garage immediately back of it, facing west on 6th street. There are barns and garages located on the east and west alley in block 40. That hotel in the north half of block 40

is 145 feet away from the tanks of the Standard Oil Company. In the south half of block 40, beginning just north of the Standard Oil Company fence is a small railroad tool house; it is a frame building about 14 x 22 feet, 27 feet from the tanks. The structure marked "coal shed" (on map, Exhibit H) is a coal shed just nine feet west of the center of the oil spur and located on railroad right of way. It is a coal bin about 150 feet long and 12 feet wide east and west. Just west of the railroad right of way in the south half of block 40 is a one story frame residence, about 95 feet due west of the oil company tanks. Just west of the tanks is a frame garage, facing south on Walnut street. Just west of that is a one story frame residence, facing west on 6th Street. The smaller squares (on map) on the north half of block 40 are outbuildings for those two resi- [fol. 207] dences. There are approximately three and one half lots in the south half of block 40, including the property of the Standard Oil Company. The hotel occupies all of the north half of block 40, excepting the extreme west lot and that portion on the east, which is railroad right of way. The house in the Northwest corner of block 40 won the prize given by some civic organization for beautiful homes. It was built in 1920. It is one story and a half. One of the most beautiful residences in Marysville. The house in the Southwest corner of the block is a more expensive home, due to the fact that it is larger. The first story is of brick, the second frame.

There are five residences with outbuildings on the north half of block 41. Four of them facing north of Elm street and one facing west on Fifth. There are six lots in the north half of that block. In the south half of block 41 there are three residences located, all facing south on Walnut street. In the center of the south half of block 41 is a tract owned by a non-resident; it is vacant.

The north half of block 20, which lies north of block 41, is entirely a business district fronting on broadway. The south half of block 20 is occupied by five residences facing south on Elm street. The one on the Southeast corner occupies more than one lot. There are six lots in the south half of the block. The nearest residence in the Southeast corner of the south half of block 20 is 435 feet from the Standard Oil Company tanks.

The north half of block 50, which lies immediately Southwest of block 40, is occupied by three residences facing north on Walnut street and one residence facing east on 6th street. There is a barn in the extreme Southwest corner of the north half of block 50. The south half of block is occupied by four residences, two of which face south on Spring street and two face east on sixth street, together with outbuildings. The Union Pacific takes a diagonal strip of a minimum of 60 feet wide and for about half the district it is 80 feet wide through block 51, which is immediately south of block 41. There are two residences facing north on Walnut street; on the right of way of that spur track there are no vacant lots in the south half of that block and west of the right of way. In the east half of the north half of block 51, east of the right of way, in the Northeast corner, is a two story residence facing north, (Tr. p. 271, should be east) on 7th street, directly west of this is a house under construction. A garage and other outbuildings are directly south of the first residence. There is a part of one lot vacant in the north half of block 51, about 30 x 40 feet. It is 143 feet from the Standard Oil Company tanks [fol. 208] to the house under construction in the north half of block 51. It is 93 feet from the Standard Oil Company tanks to the residence which is located immediately west of the right of way in the south half of block 40. It is 26 or 27 feet from the tanks of the Standard Oil Company to the coal sheds located west of their property.

The red line on the map (Exhibit H) immediately surrounding the Standard tanks indicates a wire fence. This fence is 14 feet north of the north end of the tanks and will average 15 feet west of the west line of the tanks. The designation south of the tanks of the Standard Oil Company is a leanto, that part of the building farthest south is a shed where they keep some sort of a wagon or truck, while the main building is occupied by the truck that distributes oil. It is ten feet from the north "wall" of the warehouse to the south edge of the tanks. It is 37 feet from the south edge of the Standard tanks to the south edge of the leanto.

About half of block 51 is occupied by an ice plant in the Southwest corner. There is a residence in the Southwest corner. There is a carpenter shop in the Northwest corner, and the residence in the Southeast corner, and a right of

way approximately one-third or one-fourth of the west half of the south half of block 51. The ice plant is a one story frame building, 100-42 feet, with an addition on the west 30 x 30 feet. The building immediately east of the ice plant is a barn used by the ice plant people for wagons. The lots in the block run north and south. There is one vacant lot in the south half of block 51, with the exception of an outbuilding.

The north half of block 52 is occupied almost in the center by a 100 foot right of way of the St. Joseph and Grand Island, and there is a residence in the Northeast corner, and on the west side on that half block there is a two story Hotel, about 65 x 40 feet, and a residence facing west on 7th street. The white line running down through the map is the center of the main line of the railroad track. The distance from the hotel to the nearest point of the tanks of the Standard Company is 160 feet. Seventh street is between those two properties, and the railroad runs between them, one track.

The Sinclair property is in the south half of block 71. On the west side of the south half of the block is a one and one-half story frame residence, facing West on 5th street. It is owned by Mr. Reipen. Last year this residence was enlarged and the roof raised. A half story built on it with bay windows on the north and south side. It is 58 feet distant from the south tank of the Sinclair company. It [fol. 209] is 16 feet from the tank to a one story outbuilding of some sort, west of the tank. The dashed line running from this outbuilding to the north line of Oak street is a wire fence, put there by Mr. Reipen. The yellow circles in the east half of the south half of block 71 designate the Derby Oil Company tanks and warehouse. The orange are the Cities Service tanks and warehouse. The distance from the Sinclair tanks to the nearest Derby tank is 62 feet, and Cities Service tanks 100 feet. The outside of the warehouses of the Derby and Cities Service Companies are galvanized iron. The structure shown by shaded lines on the map in block 71 is a coal shed 130 x 16 feet of frame construction with concrete floor and prepared roof. It is owned by the Bone-McLucas Lumber Company. There is a two story frame residence in the north half of block 71, facing north on Spring street; also a one story

frame residence just east of that, facing north on Spring street. There is also a galvanized iron warehouse and truck house of the Fenwick Oil Company there. The dotted lines shown on the map indicate the location of the buried tanks of the Fenwick Oil Company. The distance from the Southwest corner of the coal bin to the north tank of the Sinclair Refining Company is 75 feet, and the distance of the house in the Northwest corner of the block from the tank of the Sinclair Refining Company is 166 feet.

In the north half of block 72 is a one story residence located pretty well back from 5th and Spring streets. Facing east on 5th street and west of that, facing north on Spring street, is a two story frame barn. South and a little west of the residence is another barn. In the south half of block 72 there is a one story residence, it faces east on 5th street and is 200 feet from the Sinclair Refining Company tanks.

In the south half of block 49 there are four frame residences, two facing east on 5th street and two facing south on Spring street. The map shows only one of the houses facing south on Spring street. There is one just west of the one shown on the map. In the north half of block 49 there are four frame residences, two facing east on 5th street and two facing north on Walnut (not shown on map). The city limits extend five blocks west of 5th street.

In block 48, just west of block 49, there are two residences, one in the Northeast corner of the block facing east on 4th street, and one in the south half of the block.

[fol. 210] I don't know how many houses there are in block 43, just north of block 48 and west of block 42. I believe that the north half is entirely vacant. The south half has two residences facing south on Walnut street.

At the intersection of 5th and Oak streets there is a sudden break off in the ground of about eight feet to the southwest part, and this low place is about 150 or 200 feet wide and extends southwesterly to 3rd street. The streets are platted but there are no residences on the property.

In the tract of 60.08 acres (shown on plaintiff's Exhibit A) the ground slopes Southwest to the Blue River. It is farm land and is being farmed in wheat or oats and some corn now. The streets have never been graded up there. There is no traffic, the streets are grown up with various crops right now.

There is a sidewalk along the west half of block 71 on the south side of Spring street, which was built in 1923. There are no other sidewalks constructed in that block. Across the street, on the east side of 6th street, bordering block 71, a sidewalk has been staked out and graded. I am not positive it is finished. I staked it out in 1922 or 1923. I believe that is all the sidewalks in the blocks directly adjoining block 71. I staked out a sidewalk directly south of block 71, along the east side of that block, from Oak Street to Jackson.

Sixth street was paved from the south line of Elm street to the south line of Jackson street, four blocks. The nearest other pavement to block 71 is on Elm street which joins the new paving on 6th street and extends clear to the city limits—16th street. There is no other paving abutting on property shown in blocks 71 and 40.

In 1923 a sanitary sewer was constructed beginning at the alley between Spring and Walnut on 5th extending south one block and east one block to the alley in block 71. Then on south with a lateral running east to a point near 7th street through the alley in block 70. It is shown on the map (Plaintiff's Exhibit H) by a dotted line. The manholes shown in circles and lettering "Sanitary Sewer 1923." I constructed a sewer from a flush tank located in the alley of block 51 at 7th street across 7th street under the Union Pacific tracks and about a quarter of the way down the alley in block 52, in 1922. A sanitary sewer beginning at the intersection of 5th street and the alley in block 50 is 11 feet deep; where it intersects with the alley in block 71, it is only about 9 feet deep; in block 71 it has an average depth of about 10½ feet. It is built of 8 inch W. S. Dickey [fol. 211] glazed sewer pipe. A hole is excavated under the joints so that the entire shank of the pipe lies on solid ground, the joints are put together and filled with jute and cemented. The pipe is glazed to make it as near as possible impervious. It is my opinion that it is impervious. About 3 feet of the top soil in the alley in block 71 is black soil, a great deal of it is gumbo. Below that is yellow clay, very hard to the depth of the sewer. The soil is the same in block 70. At the initial point in 5th street, where the sewer was 11 feet deep, there was over a foot of yellow clay in the bottom, the rest was black loam. For half a block before we reached the manhole we worked into yel-

low clay. In blocks 70 and 71 it was hard digging. I haven't any opinion whether this soil is impervious to gasoline or oil. In a heavy rain, with 50 feet of ditch open in block 71, in the morning there was 5 feet of water standing in the ditch, which we had to pump out.

The lots, generally, in Marysville are 44 feet in width and the streets 80 feet wide, with the exception of Broadway which is 90 feet wide and Elm Street which is 62. The alleys are generally 20 feet wide. Generally there are 12 lots in each block, six in the north half of it. There are only five lots to the half block each of 15th and 16th streets. That is quite a distance from the properties in question.

Cross-examination:

By Mr. Evans:

The nearest building to any of the three tanks is the warehouse of the Fenwick Oil Company which scales 4 feet from the edge of its tanks. The nearest residence to any of the tanks is a residence 25 feet distant by scale from the Fenwick buried tanks.

The Standard Oil Company's tanks were there when I came to Marysville. All buildings were there when I came to Marysville with the exception that the residence in the North-west corner of block 40 was built in 1920, together with an office and garage, and the residence facing south on Walnut street, immediately west of the coal shed has been rebuilt and enlarged. The original residence was there when I came. The Reipen residence has been built over and made larger and the Fenwick Oil Company has constructed its galvanized iron warehouse. The rest of the buildings were there when I came to Marysville, except that a barn on the north half of block 71 has been burned down since the map was made.

Sewers sometimes leak. This is caused generally by sewer joints. If the cement used in the joints is left exposed to the sun it sets too quickly and has no strength. In back filling a joint is sometimes struck with a tamp. [fol. 212] Another cause of leaks in sewers is that the pipe does not rest on solid ground and the weight of two pieces of pipe comes on one joint. After a period of time the cement may fall off. A system of sewers as a whole may

from time to time spring a leak in some of the joints, it would depend on the construction. I have never seen a statement that a sewer system in a city of any considerable size through a period of ten years didn't leak. The cement mixture used on the joints is not as impervious as salt glazed sewer pipe. I have no opinion whether gasoline will penetrate substances that water will not. Manholes are constructed of concrete. I don't think that concrete is as impervious to the action of acids of the earth as glazed sewer pipe. The manholes lead into the sewer. Anything penetrating the manhole would get into the sewer. I don't know what the effect of water on a buried tank would be unless it stood there indefinitely. It certainly would have a tendency to lift it up unless the tank was anchored.

Redirect examination.

By Mr. Colmery:

The radical lines in red around the Standard and Sinclair tanks are drawn in circles around the tanks as the center, with a radius of 50, 100, 200, 400 and 500 feet. The circumference line will show all property or structures within a radius of the tanks of each company within the distance shown by that circumference line.

The map, Exhibit H, does not extend south beyond Oak street; shows only the north line of the blocks south of Oak street. The city limits are three blocks south of Oak street. The distance on Sixth Avenue south of Oak street is residential, with the exception of block 83 it is entirely owned by one man. There are houses practically one to the lot running north and south. That makes only two lots on the street out of each block and I believe there is a house on every one of those lots adjacent to the street, with the possible exception of one or two on the east side of the street down to South street. In block 83 there is only house and barn.

Recross-examination.

By Mr. Evans:

I don't know that cement can be made impervious to gasoline. Have never heard of cement being treated to make

impervious to anything other than acids. Cement in sea
alls is treated to guard against salt water. The cement
the joints of the sewer at Marysville wasn't treated. I
an't state whether or not cement in these sewer joints is
Vol. 213] impervious to the action of acid. The sewers I
ave been describing in Marysville are sanitary sewers. We
lso have a storm sewer system. It begins at 12th and
enter streets and drains the central part of Marysville.
Vhere it begins it is vitrified 18 inch pipe, which increases
size gradually. At the junction of Center and 7th streets
is reinforced concrete. On south of that it is vitrified
ylindrical glazed blocks. This storm sewer begins at 12th
nd Center Streets and extends west on Center street to 5th
treet, south on 5th to Walnut, west on Walnut to the River.
nder the tracks at 7th street the flow line of the sewer is
pproximately 7 feet below the base of the rails. There are
great many laterals. The entire north part of the town
ast of the railroad tracks has been drained by these storm
ewers into the main sewer. It starts out at 18 inches and
ncreases to 24, then to 30 and at the outlet I think is 72
nches. The cement blocks are laid up in masonry. They
ommence about 8th street. I have no information as to how
he tile pipes are joined at the joints. The laterals are
arious sized circular pipes leading from the main storm
ewer, they are made of reinforced concrete. The others
re vitrified clay pipe, salt glazed. The concrete pipe is
ot glazed. The size is from 18 to 48 inches in diameter.
anitary sewer pipe is 30 inches long. They are joined
ith cement. The storm sewer laterals are reinforced con-
rete. They are joined by placing cement mortar in and
round the joint, which makes a reinforcement extending
or 4 inches next to the joint. They are not juted. The
orm sewer was built in 1919 and 1920. The portion built
fter I was there was entirely of new material. I do not
now whether other portions were built from new or old
aterial. About 75% of it was built after I was there.
'e have built now about 19,000 feet in the last three years.
have seen a great many of the other sewers by going down
n them). I didn't see them built. But I have a sewer
ap and will say the sanitary sewers built in the last two
r three years constitute 15 or 20% of the sanitary sewer
ystem. About 85% of the sanitary sewer system was

built prior to three years ago. I have been down into possibly half a dozen manholes in the 85% of the sewers spoken of. There are about 75 or 100 manholes. The construction of those I inspected is the same as used in the last sewers laid. I do not know how the joints are made. I couldn't tell from the inside whether the manholes are constructed of concrete or plastered brick. They are bottle shaped at the top. Some are deeper than others. My observation is that they are concrete. They may have [fol. 214] concrete facing and brick back of it. Storm sewers are to carry away flood water.

C. F. Travelute, recalled for further cross-examination by Mr. Doran:

(Tr. of Testimony, pp. 300-306)

I think the Blue Valley railroad on the old right of way was built in 1870. It was never used. There was never any track laid. It was abandoned, then it was devoted to this oil service. It was rebuilt presumably about when the oil companies came there. The right of way and road bed was there long prior to that time.

The lower level west of the tanks overflowed in 1903.

Ordinance No. 306 of the City of Marysville defines the fire limits and regulates and establishes certain rules for construction. These rules and regulations relate only to buildings within the fire limits. There are certain rules for building flues outside the fire limits. We have ordinances regulating the discharge or use of fireworks or display of fireworks. I don't know of any regulations requiring owners to keep fire extinguishers on hand.

Redirect examination.

By Mr. Bennett:

The only use to which this track in block 71 has ever been put is the transportation and unloading of oil and coal. I think the coal yards were built after the oil tanks, or about that time.

G. L. Fenwick, witness called by the defendants, testified as follows:

(Tr. of Testimony, pp. 306-333))

Direct examination.

By Mr. Bennett:

My name is G. L. Fenwick, residence Marysville. I am in the wholesale and retail oil business at Marysville. Maintain an oil distributing station. My bulk station is on 6th street in the Northwest corner of block 71. My property in the Northwest corner of that block is designated on the map, plaintiff's Exhibit H, "Fenwick Oil Co." The tanks are three feet underground. Two of these tanks have been there two years and one one year.

I store gasoline and distillate and kerosene there at the present time. I store distillate in one of the tanks that has been there two years and gasoline in the other. The capacity of these tanks is 11,750 gallons each. They are made of 1/4 inch steel welded. The holes in which I put [fol. 215] these tanks were 13 feet deep. Each tank is 10 feet in diameter. I simply laid them in and leveled up the dirt around them and soaked and packed it. They are laid horizontally

There is a bolted manhole in the center of the tank. There is a vent pipe on each one of them, with a McDonald Duplex vent which is kept locked and there is an inlet pipe and what we call a suction pipe. The inlet pipe is to put gas into the tank from the car; it doesn't go through the manhole. The inlet pipes are in the top of the tanks. I fill the tanks by siphoning. Use a hand pump just to start it. I have recently installed an electric motor and pump to load out trucks only.

I hired men to dig the holes. The first four feet was black gumbo. From there down it was a kind of yellowish clay. We had to blast the first one to remove the clay. We didn't blast on the second on account of it being right next to the other tank. We had to use picks all the way down. The side of one of the tanks was exposed, when we put in the last tank, after it had been in there one year. It was

not rusted or corroded, seemed to be in as good condition as when I installed it. I examined it closely.

I have a measuring stick to determine the amount of gasoline or kerosene in the tanks. I can gauge them within ten gallons. My man measured one of the tanks last Saturday and figured out the amount which should be in there; next morning I found it 317 gallons off. I went down Sunday and measured the tank and found he was correct. And after looking over my records I found I had listed one tank wagon ticket twice. After subtracting that it showed I was seven gallons long. That was one week's business in which I handled about 8,000 gallons. To measure I put a measuring stick down in the vent until I touch the bottom. The stick is measured to 1/16 of an inch. It is specially painted with dark paint which the gasoline does not affect, so you can tell exactly where the gasoline comes to. I have a blue print showing how many gallons to each inch in the tank. You have to figure temperature separately. You can tell the amount of gasoline in those tanks at any given temperature at a certain measuring point on the stick, easily within ten gallons. A gallon of gasoline is based on a temperature of 60 degrees F. If it is above or below that you use a table of contraction and expansion to determine the exact amount you are supposed to have. We have to take the temperature in these underground tanks. In two years I [fol. 216] have never found the temperature higher than 65 degrees and never lower than 54 summer and winter with the exception of when you run a car in and take temperature right then. It usually takes about 15 hours after I unload for the temperature to settle to the temperature of the ground.

I have not to my knowledge had any leaks in these tanks. I believe I would know it if I had. They never floated out. Last summer we had more than the usual rain. My tanks were buried when the sewer was built in block 71. I recall a rain we had a year ago that flooded the sewer ditch. It didn't affect my tanks that I know of.

The covers of the manholes on the Standard Oil Company's tanks at Marysville is what is called a screw-in manhole. I investigated it this week. There is testimony here that the Standard has a manhole 18 inches wide. I

know one of them is not. There are two different kinds of manholes. One of them is simply a screwed in man hole. The other has a tin cap over it. I don't know what was under the cap.

The covers on the manholes of the Sinclair tanks in block 71 Marysville are a kind of a lid. A good deal on the order of a bucket lid, only it is iron and there is a strap iron comes over and locks down.

I have had some experience with above ground storage. I operated what is known as the Derby tanks one year. The underground tank has the advantage that you do not get the evaporation you get in an above ground tank. That is the advantage, preventing waste. The gas passes off in vapor. The amount lost would depend on the temperature. I observed the seams when I had the hole open around my tanks.

There was no buckling or opening of the seams.

Cross-examination.

By Mr. Doran:

I have lived in Marshall County all my life. Have been engaged in the oil business for myself two years. Worked for this other company one year. Have lived in Marysville 13 years. When I came to Marysville there was a part of a wye there, running down towards the Sinclair tanks. It ran from Block 71 across to the Grand Island track, from the east side of block 71. It wasn't in use when I first saw it. This was an abandoned track. The Uncle Sam Company, now the Crew-Levick or Cities Service, was there. My tanks are buried in the Northwest corner of block 71. The tanks of the Sinclair Company are on the south of the center of block 71.

[fol. 217] According to the sewer that went through, there isn't any difference in the soil where the tanks of the Sinclair Company and where mine are. The sewer went through the alley north of the Sinclair Company tanks. The sewer is at the other end of the lot from the Sinclair tanks. There is only a warehouse between the sewer and the tanks. The formation of the soil here is the same as where I dug the holes. I don't know about it directly under

the Sinclair tanks. I don't know the character of the soil where the Standard tanks are. I couldn't say whether the railroad put cinders under the tracks for ballast at the Sinclair tanks. They put some on the track last month, near the Derby tanks. I never noticed how far down they went.

I don't know the result of cinders on iron when it is below cinders and water comes through them.

My tanks are coated with factory red paint. In digging for the third tank one surface was exposed. I don't know the condition of the other side. Don't know how long they will last. The tanks are guaranteed. I guess that wouldn't prevent them from leaking. There is a bolted-on manhole on the top of my tanks. A raised flange three or four inches with a piece of steel bolted down on the flange. There is a little strip on top of this. There is a gasket there and that is bolted on solid. The only vent on these buried tanks is a two inch McDonald Duplex vent on each tank. That is the only opening through which fumes get out of the tank. The openings for filling and taking petroleum products out of the tanks are on the top. There is a flange or rim there which is welded to the shell. The top of the tank is three feet under the ground. The filling and emptying pipe is a two inch galvanized pipe. The unloading pipe runs along the top of the ground into the building and connects with the pump and then from the pump out to the tank. Outside of the building the pipe goes into the ground and remains there until it enters the tank. There are two lines of pipe connected with the tank, one from the cars to the pumps and from the pump to the tank. The pipes from the pump to the tank outside of the building are underground; the pipes from the unloading rack to the pump in the building are laying on the ground. There are three sepaarte lines of pipe from the pump out to each tank. The longest line is 35 feet from the pump, the middle one about 18 or 20 feet. The average distance of the tanks from the pump house is one-third of 87.5 feet. There are three elbows on one line, two on another. There are 14 connections and 14 chances for leaks. I don't know whether it would be safer [fol. 218] from the standpoint of leaks if you had them above ground, where you could see them. If they were above ground you could see the leak and it would be easier

to fix. If you had a leak of ten gallons a day the pump would not work. If there was a leak of ten gallons a day it would be 70 gallons at the end of the week. In order to fix a leak in an underground tank you would have to dig up the tank buried in a hole 13 feet deep, with three feet of dirt on top of it. If somebody was taking gasoline out of the tank you couldn't tell whether it was a leak.

I inspected the Standard tank because Mr. Bennett (counsel for defendants) asked me to. I went down there to accommodate Mr. Bennett, the city attorney. I examined the caps of the Standard Company's manhole and found one screwed into the top of or head of the tank. It apparently looked like a cap, like this (referring to a miniature model of a manhole.) There wasn't any top on one of the Standard Company tank manholes, the other I couldn't see. There was an iron strap over one of them. I didn't notice whether there was a slot in the strap that allowed the cover to slide up and down. I was over at the Sinclair tanks over a year ago and the (manhole) cover down there on the Sinclair tanks was both alike. The cover just set down over it. There was a strap there. I didn't notice whether there was a belt there with an opening. Didn't notice whether the caps were bolted down fast. Didn't take the cap off the Standard tanks to see the mechanism underneath it. One had a tin cap.

I never had any experience other than in handling my own pipes and tanks underground. My only knowledge of the comparative value of over ground and underground storage is limited to that experience. The only advantage of underground tanks that I can think of is an even temperature.

Vapors of gasoline are not heavier than air. They are quite the opposite of that. I don't think vapors that arise from gasoline settle to the ground.

Cross-examination.

By Mr. Evans:

I dug up the pipes around my tanks because I wanted a union in one of the pipes. I dug it up and put the union in it so that I could take the manhole off by disconnecting this union. The pipe I dug up was in good condition. I never

noticed any corrosion. I had it out and cut new threads. [fol. 219] The dimensions of the tanks are 10 x 20 feet. Capacity of each is about 11,750 gallons.

I examined the manhole on the Standard tanks from the ground. Don't know how many parts there were. Didn't notice any rivets. Didn't pay any attention. Merely noticed that they were screwed into the tank. I didn't look through the vent to see if the venting device is also screwed into the tank. Merely noticed that it was plain on top. It was locked down with a piece of strap iron extended over the top. Didn't examine so as to know whether there was any play inside of that. Don't know whether there was any play which would give with pressure. There might be as far as I am concerned.

I measure the tank with a stick. I put a measuring stick down into the tank through this vent (indicating). Assuming that the stick is put in straight up and down the number of gallons to the inch varies because of the difference in the circumference of the tank; the middle is more than at the top. The middle is about 120 gallons to the inch on the stick. The gasoline on the stick will not crawl, it has a specially prepared paint so that gasoline won't crawl. If you left it any length of time it might. The measurement is approximate. I couldn't get it to a drop or a quart. I got the stick from the Butler people. It is 15 feet long. If in putting the stick down you strike the tank not quite in the center you wouldn't have an accurate measurement. There is a two inch pipe three feet or more long. The two inch pipe would let it swing some, not much. There is five feet of pipe and you could only vary what it would let you. There would possibly be some variation. You can't measure with absolute accuracy by putting the stick in. If you do it carefully you can do it within ten gallons. I don't think you could put the stick down on slant enough to make any difference either way. At least it hasn't been my experience.

The temperature runs from 54 to 65 degrees (in my tanks). Right now it runs along about degrees. There is less loss from evaporation in an underground tank both winter and summer. I don't see how there would be any difference in evaporation in winter or summer.

I procured these tanks from the Butler people at Kansas City. I have been in the oil business for myself two years. Previous to that I worked for the Derby Oil Company one year. I was in the garage business in Marysville before I [fol. 220] entered the oil business. Before that I farmed in the south part of Marshall County.

I have two tank wagons, of 303 and 305 gallons capacity. I have no tanks or containers in which are kept gasoline above ground, except the truck tanks and five gallon measures. I have barrels for storing lubricating oil. I pipe the gasoline into my tanks through a two inch galvanized pipe. The opening into the tanks is through a 20 inch manhole pit. It extends up to the surface of the ground from the tank, it is built of brick. The manhole is built right on the tank. The opening in the tanks is 16 or 18 inches. There is a quarter inch steel plate covering at the point where the pit reaches the tank. The connection that you fill it with is right on the tank proper, outside of the manhole. There is a pit from the point where it enters the tank out to the surface of the ground. It is the one just described, both are the same pit. The McDonald vent extends about 4 feet above the ground into the air. I have not cleaned out these tanks at all since I have had them. Have not even aired them or tried to air them. I have never sent a man down in. It may be necessary to send a man into the tanks, I haven't had any experience yet. To clean them I would have to take the manhole off and get a man to go down. To prepare the tank to have a man go down, I suppose I would fill it with water first and then pump the water out; then send the man down. I would put some kind of rubber boots on him and have his clothes free from metal. There might be some vapors there, I would like to use every precaution. I haven't made any study of that. I equipped the tanks with a manhole so that I could clean them out. When it becomes necessary to clean the tanks out I would do nothing more than empty them of their contents, pump water in and then out and send a man in with rubber shoes. I think that would be right, I would find out more about it before I undertook that. I don't know what I would do in case the tanks sprung a leak. We have some tanks in Marysville leaking. A prudent business man must figure on that. If my tanks got

to leaking I would have to fix them the best way I could, would have to figure out some way.

I have never analyzed or had anybody analyze the soil about these tanks. I put the tanks against the soil without making any investigation. Had to blast it.

"Q. Did you discover any fissures?

A. I don't know what that is.

[fol. 221] "Q. Did you find any openings in the soil, cracks?

"A. No, sir.

"Q. So hard you had to blast but there were no fissures or cracks?

"A. I didn't see any; so far as I noticed there weren't any."

When soil gets so hard you have to blast it it invariably cracks at the surface, but I never heard about it under the ground.

"Q. You know about the surface but think it might be different under the ground?

"A. I don't know anything about that, I never studied it.

"Q. You don't know whether it would or not.

"A. No, sir."

My tanks are equally spaced, two feet apart.

I always calculate the temperature at the time I take measurements, always using the same stick.

In examining these tanks I noticed these duplex vents. I couldn't tell from the ground whether or not there were any vapor outlets on the manholes of the standard tanks.

There is a full block between my station and the Union Pacific main line. Have noticed no vibration from the passing of passenger trains. Have noticed vibration of the earth when standing close to a passenger train. I suppose that if tanks were close to a passing passenger train they would be subject to vibration. I don't think that would weaken the tanks to any extent. If the tanks is properly welded it is stronger at the weld than the tank itself.

Recross-examination.

By Mr. Doran:

I wasn't on the ground when I examined the manhole in the Sinclair tanks, but was when I examined those of the Standard Oil Company.

I never measured exactly how far my ware house is from the nearest residence, but it is about 10 or 12 feet.

I never took the manhole cap off the standard or Sinclair tanks, either one of them.

Redirect examination.

By Mr. Bennett:

I don't claim to be an expert. My testimony is based on my own experience, "that is all." The principal reason I [fol. 222] have my pipe lines buried is that it makes a little tighter installation and gives us that room to drive around there with the trucks. They could all be on top of the ground if we wanted them. It would be entirely possible to dig the tank up if necessary to repair it, or for any other reason.

The fence around the Sinclair property was built some time last fall, a year ago this fall. As I remember the fence was built before the trial of the Cities Service case in the district court. I believe it was tried at a special session, about December 11, 1923. It was about a week or ten days before that trial.

I have had no trouble with vibrations at my tanks. Haven't had any leaks. Have had no trouble with water getting around my tanks and floating them out. Am contemplating burying another tank at this time.

Recross-examination.

By Mr. Doran:

I have a filling station there (Marysville) and haul the gasoline from my storage tanks to the filling station in a truck. Kerosene is hauled in the same way and I distribute fuel oil the same way. One truck has a capacity of 305 and the other of 303 gallons. I haul that along the streets above ground. I have two of these glass jars (at the filling station) holding ten gallons each, above ground. The filling station is at 6th and Broadway, right in the heart of the business district. My own residence is the nearest building to the filling station, joins it only a few feet away. Never had an explosion there.

A. C. HUBBARD, a witness called by defendants, testified as follows:

(Tr. of Testimony, pp. 333-344)

Direct examination.

By Mr. Colmery:

My name is A. C. Hubbard, residence Hiawatha, Kansas. I am an oil truck driver employed by the Kimmell Oil Company since the 19th of February, 1923. I am a country truck driver, deliver gasoline, coal oil and lubricating oil in the country by International Truck. It has a tank on it. The gasoline I get from storage tanks located in Hiawatha. I haul high test from Robinson. Got some of my supply from Robinson December 1, 1923, from the Kimmell tanks there.

Am acquainted with the occurrence of a fire at the Kimmell Oil Company tanks at Robinson on or about the first of [fol. 223] December, 1923. There is a coal oil tank and the sunshine or low test gasoline tank laid flat on the ground. There was a high test tank stood upright on the south from these. There was a small building where we drove in to load trucks. The pumps were located in there. I suppose there would be three or four feet between the two horizontal tanks, and the high test tanks is approximately five or six feet beyond on the south side of the low test gas tank. The ware house is right north from the end of the horizontal tanks, I should judge about five or ten feet. This was a frame building. The building was constructed with a sliding door on the east side and one on the west. You drove in east and west on the north side of the building. The pumps occupied the south side and the driveway was on the north side. The shed was covered, it had a gable roof.

When the pressure was enough we loaded by gravity, if not enough we pumped it. They kept a few empty barrels in there on the platform where the pumps were, that is all.

I don't know the size of the horizontal tanks or their capacity, they were made of sheet metal.

"Q. Have any man holes?

"A. I suppose they did on top, they would almost have to.

"Q. Were there or not?

"A. I don't know, not from my observation I don't.

"Q. You never saw them.

"A. No, sir.

"Q. What about—were there any vents on these horizontal tanks?

"A. I don't know, I never was on top of these tanks.

"Q. When was this fire about which you speak?

"Mr. Doran: I would like to inquire what the fire is and what the purpose of this examination.

"Mr. Colmery: He has already testified that he knows of a fire that occurred at these tanks some time ago.

"Mr. Doran: The Sinclair Oil Company objects to the question and any further inquiry into this alleged fire for the reason that evidence relative thereto is not competent to prove any issue in this case. In other words, the dangerous character of the tanks maintained in Marysville, Kansas, and involved in this suit, if they have any dangerous character, cannot be established by individual instance where tanks caught fire in other places, particularly since the evidence already discloses that the tanks were equipped and operated in a different manner, the maintenance, equipment [fol. 224] and operation was different from that employed by the Sinclair Oil Company at Marysville, and I move that the testimony is wholly incompetent to establish or defeat any issue in this case.

"The Master: The testimony will be received, subject to the objection.

"Q. Will you tell the Master in your own way just how this——

"Mr. Doran: I want it understood that this objection stands to every question touching this incident about which they are speaking.

"Mr. Evans: The Standard Oil Company makes the same objection and asks for the same understanding.

"Mr. Doran: I would like to have an exception allowed as to the court receiving any evidence of that nature."

—. The date of this fire was December 1, 1923. I had just finished loading my truck in the loading building.

"Q. Now will you tell the Master in your own was just how it happened?

"Mr. Doran: Do I understand the Master? I understood you to say that our request was overruled, and that request was that the objection I made to the first question stood as to all questions.

"The Master: That is the understanding.

"A. I had just finished loading my truck, reached in with my right hand to shut off the valve, and had a drop cord in my left hand. I touched the gas line with this guard on the electric light bulb, and caused a spark, which ignited the gasoline."

The drop cord hung down probably six or seven feet from the ceiling. It had an electric light bulb on the end of it. The guard was a wire guard around the bulb to keep it from breaking. It ignited the gas in the tank on the truck and it sure did burn.

The first thing I did was to run out to the tank and shut off the valve of the tank. Next I tried to run my truck out but the fire got me before I could get it out and it burned the truck and the building, finally ignited the tank and they burned. My tank truck was on the north side of this building. The two horizontal tanks, coal oil and low test gasoline, [fol. 225] caught fire first, then the other tank. I was so excited I don't know where the fire first showed upon the tank. The seams of the tank finally leaked, broke and leaked, on the north side was where I noticed it. Both tanks I think. Where it sprung a leak it would ignite and catch fire. I think there was flame on top too. I would say when the whole works got afire that it probably went into the air forty or fifty feet. The tanks all three finally burned. The ware house burned clear down. Some box cars on the railorad track burned and I think some telephone poles or something of that nature and some lumber. I am sure two box cars burned up. I don't know how far they were from the tanks, it would be only guess work. My best judgment is between 20 and 50 feet.

There was a barn across the street on the north and an elevator on the west. The fire department came. The barn did not burn. They sprayed water on it until the fire subsided and it was safe. They shot holes in the tanks with a high powered rifle. I don't know how many holes. I think they shot holes in all the tanks. They shot into the

lower half of the tank, below the gas line. The gas came out of the holes, ignited and burned and at each place where there was a hole it immediately caught fire. You could see where the gas line was, it showed very plain. By gas line I mean the level of the gas in the tanks. The tank was hot above that line, it looked white. Below the gas line it appeared the same as water would have, cooler.

"Mr. Doran: I have no cross-examination. I am standing on my objection, and ask to have each and every answer and question relative to the Robinson fire stricken out, for the reason that the character of the Marysville tanks—the character of the Marysville tanks as being dangerous or otherwise within the police power of the city cannot be proved by testimony relating to fires or specific fires elsewhere, and for the further reason that the manner of the operation, equipment and tanks described by the witness at Robinson is totally different from the management, operation and equipment of the tanks of the Sinclair Oil Company at Marysville, and this being true, this is not competent in any way to prove the character of the tanks at Marysville, and I ask to have this testimony stricken out.

"The Master: Overruled at the present.

"Mr. Doran: Not- our exception to that ruling."

[fol. 226] Cross-examination.

By Mr. Evans:

The tanks I have described at Robinson are somewhere between 25 and 50 feet north of the railroad track. The box cars that were destroyed on the track were, I think, directly south of the tanks. The telegraph poles and lumber that burned were between the tanks and the railroad track and a little to the west between the tanks and the cars. The fire from the lumber and telegraph poles was communicated to the box cars. I suppose it was about 25 feet from the lumber and poles to the box cars. I don't know how far it was from the lumber and poles to the tanks. I know the fire was communicated from the tanks to the lumber and telegraph poles and from the lumber and telegraph poles to the box cars.

High test gasoline is gas of higher end point and higher gravity than ordinary gasoline. About as near as I can

tell, end point is the degree of heat under which it will fire, begin to vaporize. The degree of heat at which the vapor will begin to ignite. High test gasoline has a higher gravity than other gasoline, it would test 65 or 70 and the low around 60. High test gasoline will fire quicker than low test. It would varporize and fire quicker at a lower temperature.

The holes shot in the tanks were below the gas line; gasoline ran out of the holes. Vapor came out of the holes. I think there were no holes above the gas line. Vapor would naturally be above the liquid. Vapor was running out below the gas line. There must have been vapor below the gas line. I didn't notice any of the fire that came out of the high test tank. We were on the north side and the low test and kerosene tanks were the only ones I noticed.

The truck was grounded. It had a chain on it. The chain is to ground the electricity that might be in the air or in the tank (on the truck). The tanks are iron or steel. There was an electric light on the extension drop cord. I had used it before in a similar way. I never gave a thought whether there would be a spark on account of the high end-point of the high test gasoline that was likely to cause it to ignite.

"Mr. Doran: I now renew the objections I have made to the direct testimony against all of the questions and answers asked on cross examination of this witness.

"The Master: Same ruling.

"Mr. Doran: Except."

[fol. 227] H. O. Decker, a witness called by the defendants, testified as follows:

(Tr. of Testimony, p. 344-356)

Direct examination.

By Mr. Bennett:

My name is H. O. Decker. Residence Robinson, Kansas. I am Chief of the Fire Department of the City of Robinson. I recall a fire at some oil tanks there about December 1, 1923. I was fire chief at that time.

"Q. What was the first notice you had of that fire?

"A. I was out in front of the garage there, and looking down to the east I seen some smoke rising east of the elevators.

"Mr. Doran: The defendant, the Sinclair Oil Company, makes the same objection to this testimony made to the testimony of the last witness, for the same reasons. We are objecting to any testimony from this witness relative to the fire.

"Mr. Evans: The same objection from the Standard.

"The Master: Same ruling.

"Mr. Doran: Exception."

Seeing smoke I ran into the garage and hollered "fire" to them and cranked up the fire truck, which was kept in the garage, and went down. The building used to load gasoline into the trucks was all afire. The smoke boiling out of it. It was the Kimmell Oil station, it was located east of the A-J elevator about 75 or 100 feet, anyway. There were three tanks there used for storing oil. There were two horizontal tanks north and south on the ground and one stood upright. They were south of the warehouse. The A-J elevator is west of them and the barn 60 to 75 feet north. A little to the Northwest, just across the street, was a big barn used for storing, a fuel barn they called it. There were some box cars on the railroad track. I don't know how many, and there were some bridge planks and creosoted poles and piling. These piles were about 4 or 5 feet high and about 7 or 8 feet wide. They were on the right of way somewhere along 30 or 35 feet from the tanks. The box cars were 50 or 60 feet south of the tanks. The wind was blowing from the Northwest; it was blowing away from the Aunt Jemima Elevator, and towards the box cars.

When I got there the building was all on fire, smoke boiling out. Saw we couldn't get to it so much smoke and heat. Didn't get very close at first. Don't know how far, [fol. 228] a couple of hundred feet. The building kept on burning and burned down. There was some explosions inside while the building was burning. Don't know what they were. There was gasoline truck in there. Don't know whether it was the truck tank or barrels which exploded.

I investigated after the fire; the seams in the compartments of the truck tank were opened up. The barrels of lubricating oil were blowed open too. The wind blowed the flames into the storage tanks. There was kerosene in one tank and gasoline in the other two. One was high test.

While the building was burning the heat from the building caught fire to the vapor that came from these storage tanks, from the vents. They had some goose neck vents on them and the elbow turned down, and they had manholes.

"Q. What kind?

"A. Screwed in, about that big around, (indicating), they had threads on them when we looked at them after the fire. Screwed down.

"Q. Did they have anything that looked like this, only on a larger scale, inside?

"A. No, sir.

"Q. Was there anything like that?

"A. No, it was solid.

"Q. Did it have a loose cover on the top?

"A. No, sir.

"Q. Was there any kind of a vent in the manhole cover?

"A. No."

The heat from the building caught fire to the vapors escaping from the vent. The heat from the building got these tanks hot and they opened up the seams where they were riveted together. They just kept on burning. The tanks got hot—pretty red. There was a flame coming out of the seams of these tanks as they burned and they had a roaring noise from the tank that stood upright. After it got hot it broke open and made a roaring noise and the gas flowed from it and burned. We got afraid of them and decided to shoot holes through them to relieve the pressure inside the tanks. The flames shot up in the air, whenever it would belch out through a volume of black smoke fifty to seventy-five feet in the air, when it was boiling out. It communicated fire to the piling and the box cars to the south; three box cars burned. I should judge they were from 50 to 60 feet from the tanks. The fire department put water on the barn and elevator; it was west of the tanks. The wind was blowing from the A-J elevator to

the tanks. You couldn't stand to put your hand on the boards of the elevator, it was so hot. The heat caused the sap to run out of the pine boards on the barn, on the north [fol. 229] side of it. It was 50 to 75 feet away. The wind was in the Northwest, the barn was north of the tanks, and generally blowing from the barn towards the tanks. Water was kept on the barn and elevator to keep them cool and prevent them from catching fire.

"Mr. Doran: The plaintiff, the Sinclair Oil Company, objects to each and every question asked the witness and each and every answer by the witness, relative to the Robinson fire, and asks that the same be striken out, for the reason that no issue presented by the pleadings in this case is proved or disproved by this evidence, and the evidence does not tend to prove or disprove the dangerous character, if any, of the tanks of the Sinclair Oil Company in Marysville, in that the evidence of the witness fails to show conditions surrounding the tanks of the Sinclair Oil Company in Marysville, Kansas are the same, or the equipment is the same, or the manner of operation is the same, as the tanks, their operation and equipment, about which he has just testified, and for that reason the testimony is incompetent.

"The Master: Same ruling.

"Mr. Evans: We make the same objection for the Standard.

"The Master: Same ruling.

"Mr. Doran: Exception."

The gasoline ran out of those tanks on the ground, where we shot holes in the tanks the gasoline ran out. Didn't run very far. They opened up one of the valves on the tank once and it ran out on the ground and to the north of the tanks and burned towards the ditch along the side of the road, fifteen or twenty feet. The purpose of opening the valve was to relieve pressure in the tank; there was pressure in the tank.

"Mr. Doran: I want to renew the objection for the Sinclair.

"The Master: Same ruling.

"Mr. Doran: Exception."

Cross-examination.

By Mr. Evans:

The oil tanks referred to were north of the railroad tracks, 50 or 60 feet. The cars were on the track directly south (of the tanks.) It was 20 or 30 feet from the tanks to the lumber and creosoted piles and poles that were burned. I first noticed the ties, poles and lumber burning after the building was burned down, and the gasoline was [fol. 230] burning from the tanks. The box cars were higher than the poles and I think they caught on the roof first. The ties and poles ultimately caught fire. The holes were shot in the tanks while the box cars were burning. The holes were shot into the tanks below the level of the gasoline in the tanks. They were shot in all the tanks. I don't know how many. I didn't do any of the shooting and it wasn't done under my direction. I know that holes were shot in each of the three tanks. The shooting was in an interval of about half an hour. The upright tank was shot first, the gasoline tank next. I couldn't tell exactly how much time there was between shooting the holes in the upright tanks and in the gasoline tank, it was something like half an hour. My best judgment is that 3 or 4 holes were shot in each tank. Two guns were used. I think the second and third tanks were shot into about the same time; when they shot one and the gasoline would run out then they would shoot the other tank. Holes were shot in all three tanks during the first few minutes. The fluid coming out of the holes immediately ignited. As the number of holes increased in the tank the volume of flames increased. Two of the tanks are there now. The other one is out in the country. It was cut down, cut half in two, and put into the ground for a bridge, or culvert.

I had seen the goose neck on these tanks before the fire and noticed it afterwards, the Kimmells said it was a vent, I didn't examine it myself. I was a witness in the case of the Cities Service Company at Marysville and testified about the same matter.

"Q. In the course of that examination, were you asked the following question: 'Question. Did these tanks have the vents on them?' and I will ask you if you didn't answer in

substance as follows: 'They said so, I didn't examine them'?

"A. I didn't examine them, no."

I don't remember whether I testified to that. I didn't crawl up on them at no time. I didn't examine them. All I know about these vents is talking to some of the Kimmells.

There was a gasoline truck being filled at the time in the warehouse, and this truck took fire. I don't know what was in the barrels. There was something in there. I don't know whether there was any lubricating oil in them; there was an explosion there; it might have been lubricating oil I don't know what exploded.

[fol. 231] "Mr. Doran: On behalf of the Sinclair Oil Company the objections and motions to strike heretofore lodged against the evidence of this witness in chief is renewed against the cross-examination.

"The Master: Overruled at the present. The testimony will be received subject to your objection."

Redirect examination.

By Mr. Bennett:

I examined these tanks the next day after the fire. I noticed some vents there. The goose neck is about a 1½ inch pipe that comes out of the tank and makes a reverse turn. I looked at these tanks and found that they had that sort of a vent on them. Nobody told me that, I saw that myself. Mr. Kimmell, the owner of the tanks, directed the shooting to relieve pressure on the tanks. Robinson is approximately 75 miles from Marysville.

"Mr. Doran: The Sinclair Oil Company renews its objections and motions to the redirect examination as heretofore made.

"The Master: Same ruling.

"Mr. Doran: Exception."

Henry Quinley, a witness called by the defendants, testified as follows:

(Tr. of Testimony, 356-361)

Direct examination.

By Mr. Bennett:

My name is Henry Quinley, residence Blue Rapids, Kansas. I was at one time engaged in the oil business at Greenleaf, Kansas, employed by the Standard Oil Company.

I recall an incident of a fire in the Standard Company tanks there on September 6, 1923. I was present at the fire for awhile. I was truck wagon salesman for the Standard Oil Company from the Greenleaf station. On the date mentioned I was unloading a tank car of gasoline into the storage tanks.

"Mr. Doran: The Sinclair Company objects to the questions asked—the last questions—for the reason that the evidence inquired for doesn't prove or tend to prove any issue in this case, and particularly it is not shown that the manner of operation, equipment and character of the tanks described by the witness at Greenleaf, Kansas, is the same or similar to the tanks at Marysville, and for that reason the [fol. 232] evidence is wholly incompetent, and also the same objection for the Standard.

"The Master: Overruled for the present."

The tanks of the Standard at Greenleaf were horizontal. There were two. They lay north and south. The warehouse is on the south end of the tanks. I should judge it was approximately 8 feet from the south end of the tanks to the warehouse. My truck was about 20 feet east of the warehouse, not in the warehouse. I was unloading a tank car of gasoline into the storage tank with a gasoline engine attached to the McDonald pump. There was a jump spark used with a vibrator.

"Q. As a I understand, there was a little eccentric wheel

"A. Yes, and a spring which makes a contact.

"Mr. Doran: I would like to have my objection run to all these questions.

"The Master: I don't think it is necessary for you to repeat the same objection over again."

To describe what happened there, "I will have to start a little before the fire happened. They were using a Galloway engine, and it was worn out, so the company installed another engine for me, and they put in a Newny—I am not sure of the name—and it had a spark plug with a vibrator, and in making the contact, there was an eccentric to make the contact, and in unloading a car of coal oil before this I noticed that this spring touching the eccentric caused a spark. Well, I unloaded the tank car of coal oil, all right, and then this car of gasoline come in and I was in the warehouse all the time it was unloading, and I got almost thru, and I climbed up on the storage tank to see my capacity, and then I noticed I had very little room left in my storage tank, and I went out to the tank car to see how much was left there, and when I got there I saw I had too much gasoline, and I started back into the warehouse to shut off the engine, and when I got to the west door of the warehouse, I smelled gasoline fumes out in the open air, and I knew the tank had run over. My only thought was to shut off the engine and prevent a fire if I could. My storage tank was running over. I got pretty near there, and then went back the other way, because the fire busted out and met me at the door. I still carry some scars yet. And the next thing I done I got back in my truck and went to town and to the restaurant, where I was boarding, and the doctor came and gave me first aid."

[fol. 233] On the 13th of September they checked me out but I didn't see the tanks. (At the time of the fire I left just as quick as I could.) The wind was blowing from the northwest. I am not a judge of velocity but I should think about 25, 30 or 40 miles per hour. This engine stood at the end of the gasoline tank between that and the warehouse, and the wind blowing from the northwest blew gasoline as it came out of the tank into the gas engine. The air striking the gasoline turned it into vapor and it immediately caught fire. As I said before, it caught me as I got to the door on the way out to shut off the engine, before I could turn around and get out the building was in flames inside, caused by the fumes from the pumping of the gas. This was September 3, 1923.

The manhole was a combined manhole and safety vent, like that only larger, Exhibit X. (Evidently an error in the transcript; there is no ExhibitX.) It had a sheet iron top over that. This is a miniature of the sort of manhole used there on both tanks. I don't know the name of the other vent, couldn't say that it was a McDonald vent. It was about the same, it looks very much like plaintiffs' Exhibit D.

"Mr. Doran: The plaintiff, the Sinclair Oil Company, now renews its objections to each question and answer as it appears in the record of this witness' testimony in regard to the Greenleaf fire and asks that it be stricken out.

"Mr. Evans: The same objection and motion for the Standard.

"The Master: Both objections overruled for the present. The testimony will be received, subject to the objection.

"Mr. Evans: Note our exceptions."

Cross-examination.

By Mr. Evans:

I think the tank car was not over 40 feet away from the tank which I was loading, I never measured it. The oil was conveyed from the tank car through pipes. The power was furnished by an engine. The difficulty was that I tried to put more gasoline into the storage tank than it would hold, it pumped faster than I figured on. I couldn't say whether the brass valve on the tank was melted off, I went away too quick. All the gasoline in the tank car was drawn off. It didn't burn. There was no explosion. The warehouse is all I know that burned up. I got out of there and was home in less than an hour. I can't say whether the tanks are now there.

[fol. 234] "Mr. Doran: I wish to renew my objection on the part of the Sinclair Company which I made to the direct examination of this witness.

"The Master: Same ruling.

"Mr. Doran: Exception."

HARRY FRANKENSTEIN, a witness called by the defendants, testified as follows:

(Tr. of Testimony, pp. 361-370)

My name is Harry Frankenstein. Residence Alexandria, Kansas, nine miles north of McCracken. I am tank wagon agent for the Sinclair Refining Company. I recall the fire of August 4, 1922 at the Sinclair tanks in McCracken. I was there at that time. Went over from Alexandria to McCracken to get a load.

"Q. What were you doing just before the fire?

"A. I drove my truck into the warehouse and the agent at the time he started to crank the engine and had a little trouble——

"Mr. Evans: I want to object to the introduction of any testimony as to the fire at McCracken as incompetent, irrelevant and immaterial, and don't tend to prove or disprove any issue in this case, and for the reason that it hasn't been shown that the equipment and surroundings were similar to the equipment and surroundings and manner of operation at Marysville.

"Mr. Doran: And you can't prove the dangerous character of a particular thing by describing individual instances of occurrences at other places.

"The Master: The testimony will be received subject to the objection."

The warehouse and two upright tanks, one kerosene, one gasoline, were at the plant. I am familiar with the equipment the Sinclair Company uses (referring to something not shown in the transcript.)

Over the objection of the Sinclair Company the witness testified: "This is standard equipment with them."

The tanks were upright, capacity 16,000 gallons each. They had manholes about two feet across. They had these [fol. 235] McDonald vents. They were welded with a clamp on one side and a hook on the other, to hook them over and lock them. One side of the cover was not fastened and you could raise it up and down. There was a hook to lock it.

"Now, on this particular day you started to tell us about cranking the engine. Go ahead.

"A. We cranked the engine and it backfired.

"Mr. Evans: I suppose the same objections will lie to each question propounded this witness.

"The Master: Yes."

The carburetor backfired and caught the gas and oil on the floor. We put sand on it and tried to put it out but it got too fast for us. My brother-in-law called the fire department. The blaze was in the warehouse. The platform was in the warehouse with the pumps. These pipes all got loose and let the gas flow out, and the gas commenced burning on the outside of the warehouse. The gas flowed from these tanks out in the road. The warehouse and tanks burned. The manhole covers were blown off both tanks. The gas shot through the top of the tanks and burned inside but didn't blow the tanks up. The valve was open, the gasoline running out. It ran in the road over to the K. T. tanks, about 30 feet, and communicated fire to the K. T. tanks and the K. T. warehouse. The K. T. warehouse burned down and the tanks exploded. One tore the roof off and the other was lifted off its foundations. These were upright tanks.

"Q. Were they equipped with vent and manhole?

"A. I never paid any attention."

Didn't look after the fire. This was the Kansas & Texas Oil Company plant. It exploded the gas tank and threw it off the foundation, about ten or fifteen feet. One of the K. T. tanks was gasoline the other kerosene. It was the roof of the gasoline tank that blew off. The kerosene tank blew into the road. I never went over and examined it.

"Mr. Doran: Our usual objection is renewed, and motion to strike, for the Sinclair.

"Mr. Evans: The same for the Standard.

"The Master: Overruled; the testimony is received subject to the objection.

Mr. Doran: Except."

[fol. 236] Cross-examination.

By Mr. Doran:

The fire was caused by backfiring of the engine which pumps the gasoline from the tanks into the wagon. The gasoline came from the carburetor of this engine, it flooded. The warehouse caught fire and burned. It was of sheet iron. It twisted all up. The platform in the warehouse was of wood, about 18 feet long, and probably 10 feet wide. The volume of oil or gasoline came from the gasoline and kerosene storage tanks, after the fire started. They were six feet from the warehouse. The valves next to the tank were open. I had to have them open to load the truck. The oil flowed from the tanks to the pump. When the fire started they were closed on the inside of the warehouse. When the warehouse burned down it caved in and broke the connection. The pipes that run from the big storage tanks are never shut off at the storage tanks, they could have been. Some of the boys had long range rifles there; shot 7 or 8 times; shot holes in the part of the tank that was filled with gasoline. I wasn't there when they shot.

The gasoline and coal oil that communicated fire to the other tanks came out of the pipes. You could see the fire following it up. I couldn't say whether the coal oil or gasoline came out of the holes made by the bullets or out of the pipes.

"Q. Now, was there any explosion there——

"A. The K. T. tank exploded."

I don't know what caused the K. T. tank to have such a fire around it that it blew up. There could have been no fire around the K. T. tanks on the outside without some gasoline vapor or coal oil being there. One of the K. T. tanks was blown off the foundation, and I don't know whether there was any oil in that left or not. There was quite a big fire in the K. T. tanks and the Sinclair tanks also. They had been shooting at these tanks. "I heard them." There was only one rifle. All the time during the fire the valves were broken at the tank and were left open. The gasoline escaped through those open pipes and furnished fuel for the flames. The valves were open on the

outside but were closed on the inside of the warehouse, but when the warehouse was tipped over they were broken off and the gasoline ran over.

[fol. 237] Redirect examination.

By Mr. Bennett:

"Q. Your brother-in-law——

"Mr. Doran: I want to renew *by* objections and ask that this all be stricken out, this cross-examination, for the reason that it appears on cross-examination he doesn't know the cause of the fire nor the circumstances, and equipment and surroundings are not the same as circumstances, equipment and surroundings prevailing at Marysville.

"The Master: Do you mean you want your own cross-examination stricken out?

"Mr. Doran: I do, I want it all stricken out.

"Mr. Evans: The same objection for the Standard."

My brother-in-law is employed by the Sinclair Company as local agent at McCracken.

I couldn't say that the K. T. tanks took fire before or after the shooting of the holes in the Sinclair tanks took place. I first saw flame out on the ground after the shooting.

"Q. Wasn't there any before the shooting?

"A. Yes, there was before the shooting. The gas was flowing out of the tanks of the Sinclair——" and running down the road before the shooting. That was before the K. T. tanks took fire. The warehouse was the first thing that took fire at the K. T. tanks. That fire was caused by the flowing (of gasoline or coal oil) from the Sinclair warehouse down the road to the K. T. station. There hadn't been any shooting at the time the K. T. warehouse took fire.

Recross-examination.

By Mr. Doran:

I didn't notice whether the fire increased materially after the shooting. It naturally got bigger all the time after the warehouse took fire.

HERM KEUFFER, a witness called by the defendants, testified as follows:

(Tr. of Testimony, pp. 370-379)

Direct examination.

By Mr. Bennett:

My name is Herm Keuffer. Residence McCracken, Kansas. I am Fire Chief there. Have been fire chief since 1922.

[fol. 238] I recall a fire, some oil tanks there, in the afternoon of August 4, 1922.

"Q. Just tell how your attention was first directed to the fire.

"A. I was working on a power house about two blocks away when I seen the fire department arrive, and I went up a little after the fire department went up, probably fifteen minutes after the fire had started, I judge.

"Q. Tell us what you found when you arrived?

"Mr. Doran: The Sinclair Refining Company objects to this question and to any other questions relative to this fire as wholly immaterial for the purpose of sustaining or refuting any issue that may be involved in this case, for the reason that the character of the tanks at Marysville as coming within the police power of Marysville can't be proved by individual instances of fires elsewhere, and for the reason that the evidence is wholly incompetent.

"Mr. Evans: The same objection for the standard.

"The Master: It is overruled, the testimony will be received subject to the objection."

"Q. Tell us what you found when you arrived?

"A. When I got within about a half block of the Sinclair tanks the warehouse was all afire and on the outside of it and——

"Mr. Doran: The objection is renewed to every question about this fire."

I told the fire department not to put any water on the fire but on the buildings near by. There were other gas and oil tanks full in the warehouse and they would explode

and some would go 20 or 30 feet in the air and throw oil all over the tanks, and the gas would run down this ditch to the K. T. and set the K. T. on fire, the fire occurred there the same as the Sinclair; it seemed that the barrels exploded. The Sinclair tanks had not taken fire when I got there, the ware house was burning. The warehouse collapsed, then there was a big smoke and fire, the fire naturally increased them. The gasoline seemed to run from the warehouse down to the ditch. It looked like it was coming out of the warehouse. There was no fire at the Sinclair tanks, themselves, at that time. After some of the barrels exploded and throwed oil over the tanks, then it would burn for a little while and then slow down again.

[fol. 239] The manhole covers on the Sinclair tanks blew off and for a little while the fire shot out of the tanks. The gasoline continued to run from the warehouse down the ditch. The Sinclair warehouse is about 65 feet from the K. T. warehouse. The running gasoline was on fire burning as it ran. The first fire at the K. T. tanks was at the warehouse. The warehouse caught fire very fast and collapsed and the barrels kept exploding one after another. One of the K. T. tanks exploded at the top, the whole top blew of-, and the other raised up about 8 feet from the ground and the bottom blew off. It lit on its side. Defendants' exhibits 1, 2, 3 and 4 are the tanks that burned down at McCracken. The pictures were taken by Mortimer. I saw him there and am able to recognize the location.

"Mr. Bennett: We offer them .

"Mr. Doran: I object to them as not properly identified and for all the reasons stated in other objections to other questions, particularly as to not being competent evidence to prove any issues in this case, and the issues in this case cannot be established or defeated by showing individual fires elsewhere, and nothing is shown to establish that the conditions and manner of maintenance and operation is the same as at Marysville.

"The Master: The testimony will be received, subject to the objection.

"Mr. Doran: Except."

The Clerk will here insert copies of defendants' exhibits 1, 2, 3 and 4.

Exhibit 1 shows the K. T. tanks, are on the east side, they caused the biggest wreckage. The one lying on the ground and the other blackened. The blackened ones are the Sinclair. They stood up and the K. T. fell down. The tanks appearing in the right hand side of the picture are the Sinclair tanks. Right here this one is the K. T., one fell over and the bottom come out. The twisted iron there is the K. T. warehouse. You can't see in the picture where the Sinclair warehouse was, it is north behind the tanks. The wind was blowing Southeast. It blew the fire away from the elevator.

"Mr. Doran: Object for all the reasons heretofore stated.

"The Master: Overruled."

[fol. 240] The houses were 100 feet away. The fire department kept water on the houses and the elevator to keep them from catching fire. I examined the K. T. tanks to determine their condition after the fire.

"Q. What sort of vents and manholes did the K. T. have?

"Mr. Doran: We object as wholly immaterial.

"The Master: Overruled.

"A. They had a manhole sixteen inches in diameter, made of the same material as the tanks, and bolted down to the tank."

That is the cover. They have a four inch collar welded on the cover and a plug screwed in. In the other side of the manhole is a two inch cover that is welded on the top. That is, it was threaded when I saw it, but there was nothing there.

"Q. Did you investigate the Sinclair tanks?

"Mr. Evans: We now move to strike out the testimony of this witness and all testimony relative to this fire for the reason that it is disclosed that the tanks were equipped in a manner different from the tanks of the Sinclair and the Standard at Marysville.

"The Master: Sustained.

"Mr. Bennett: This is introduced—Here is the situation at Marysville. Here are the Sinclair tanks, and just across the road are four more tanks there, not of the equipment as shown in the testimony. The purpose of the examination is to show that the tanks aquipped as tanks at Marysville will spread fire to other tanks near by. Which part of the testimony do you particularly object to?

"Mr. Doran: All of the testimony.

"Mr. Bennett: We don't believe the objection should be sustained.

"The Master: That part with reference to tanks with different equipment is sustained.

"Mr. Bennett: Kindly note our exception.

"Q. Did you make any examination as to the Sinclair tanks?

"A. No, sir.

[fol. 241] "Q. As to manholes or vents?

"A. No, sir.

"Q. I believe that is all.

"Mr. Doran: I renew the objection to this testimony and each and every question and answer, for the reasons stated, and move that the same be stricken out.

"Mr. Evans: Same motion, and for the additional reason that it is not shown by the testimony of this witness that the equipment of the tanks about which he has testified is the same equipment as the tanks at Marysville.

"Mr. Doran. I will join in that.

"The Master: Overruled.

"Mr. Colmery: In the case in main it was shown that there were a great number of safety devices in use. The companies here think theirs is the best, and we claim that the tanks will explode, no matter what safety devices are used, and we think the evidence is material for that reason.

"The Master: The testimony will be received subject to the objection.

"Mr. Doran: Exception."

Cross-examination.

By Mr. Doran:

Holes were shot in the tanks at McCracken by Clarence Peer and another fellow. The shooting was not done under my direction. The holes were shot very high in the tanks.

"Q. Down below the fluid line?
"A. I think not, but I don't know."

I didn't see any gasoline or coal oil running out of the holes; there was gasoline running down the road; it came from the wreckage of the warehouse; I think it was from the pipes, that were connected with the storage tanks. I don't know where it came from.

Redirect examination.

By Mr. Bennett:

Just before the manhole on the Sinclair tanks exploded there was a sizzing noise like air escaping. It was about like the noise made when you open the valve on a steam engine with about *about* 20 pounds pressure, a rumbling, sizzing noise.

[fol. 242] "Q. Where these shots fired in the tanks before or after the K. T. warehouse took fire?
"A. They were fired before.
"Q. Before the K. T. warehouse took fire?
"A. Yes sir. Right early in the game.
"Q. You think that they were fired about the gas line?
"A. Yes, sir"

I didn't see any liquid burning out of the holes, or anything come out of the holes. The flow lines around those tanks, from the tanks, themselves, into the ware house, came pretty close to the ground, they came from the bottom of the storage tanks to the pumps.

HARRY FRANKENSTEIN, a witness called by the defendants, was here recalled for further examination:

(Tr. of Testimony, 379, 380)

Direct examination.

By Mr. Bennett:

The flow lines at the Sinclair tanks in McCracken running from the tanks into the warehouse were coupled on the bottom of the tank, about a foot from the bottom, and ran into the ware house and then connected up. There was a valve about four feet from the end of the pipe line. The pumps were in the center of the line. The flow line runs into the pumps. Then there is another line that runs off to the end of the platform where they couple a hose on. The gasoline was running out of the bottom of these large tanks from the pipes which were about a foot from the ground; it ran out of the pipes down the road towards the K. T. tanks.

"Mr. Doran: I move that this be stricken out for all the reasons urged heretofore against testimony of this character.

"Mr. Evans: Same objection for the Standard.

"The Master: Same ruling.

"Mr. Evans: Exception."

Here plaintiffs requested that their case in chief be reopened for the purpose of introducing newly discovered evidence.

"The Master: All right, I will consider it."

M. W. SMITH, a witness called by the defendants, testified as follows:

(Tr. of Testimony, pp. 380-388)

[fol. 243] Direct examination.

By Mr. Colmery.

My name is M. W. Smith. Residence Fort Scott, Kansas. Have been Fire Chief there about nine years and have been 35 years with the fire department.

There are four oil co[illegible]panies with supply stations there. I am familiar with the property of the Ft. Scott Oil Company there; it is located on Hill street and the Missouri Pacific right of way.

"Q. Can you recall a fire at that property along about December, 1919?

"Mr. Evans: We object as being incompetent, irrelevant and immaterial, and not tending to prove or disprove any issues in this case.

"The Master: Overruled.

"Mr. Doran: Exception. We make the same objection for all the reasons heretofore stated.

"The Master: The testimony will be received subject to the objection.

"Mr. Evans: And with the same understanding.

"A. Yes."

That fire was on December 16, 1919, between 9:30 and 10:30 o'clock that morning. We received an alarm for a fire at the Fort Scott Oil Company. I was at the fire station. We responded to the alarm. On arriving at the location we found the Ft. Scott Oil Company's ware house on fire. The tanks and property were on fire when we arrived. I was there all the time during the fire. Defendant's Exhibit 5, is a photograph of the tanks after the ware house had burned down. Defendants' Exhibit F. is a fair likeness of the fire and premises. The railroad tracks shown in defendants' Exhibit 5 are the side tracks, and main line of the Missouri Pacific. The side track is nearer the tanks than the main line. The tracks run east and west. The east is the right of the picture. The tanks shown in the picture are those of the Ft. Scott Oil Company. The west of those tanks was gasoline and the east was coal oil. The ware house was about four feet west of this gasoline tank. That would be to the left of the picture. The standard shown in the picture at the right side is where they unloaded their car tanks.

[fol. 244] When I arrived there both tanks were burning and the warehouse was burned down, all but this west side. The ware house was a common wooden studded building and covered with galvanized iron. It was approximately

20 feet east and west 25 feet north and south. When we arrived we laid a line of hose and the owners of the tanks told us that there was a tank set just west of this ware house, 8,000 gallons, plumb full of gasoline. He told me that "the thing is full of gasoline and you better hadn't get up there." We threw a stream of water on the west side of the warehouse, which was still standing, and we shoved the tin over the fire and held the stream of water on the full tanks of gasoline, and occasionally wet the bottom of this other gasoline tank burning, to keep it cool as much as possible. The fire came mostly from the top of the two vertical tanks. It was burning at the top.

There was a manhole in both tanks on the west side of the tank, on the top. I never inspected them after the fire, never went up to them before or after the fire. They looked like a hinge on part of the roof and laid over. I don't know what was under it because I never looked. Occasionally there were flames shooting from the top of the tank. The smoke was rolling and every now and then there would be a gush, the blaze would go up in spots through the smoke, sometimes 50 feet high, then scattered around through the smoke. We were 20 feet away from the tanks when they were burning. We were on the wind side, it was pretty warm. The wind was blowing from the south, it was blowing the heat away from us. Looking at the picture, Exhibit 5, you are looking straight north. We were on the south side of the tanks. Occasionally there was a roaring sound like there was gas and it would belch out. The fire occurred between 9:30 and 10:30 A. M. and continued until about three o'clock in the afternoon. I don't remember exactly. There were no reports and unusual noises during the fire in the warehouse, none at all. The warehouse was covered with corrugated galvanized iron. The east side of it fell and we shoved the west side down. The building shown to the rear and to the west of the west tank in the picture is the brick plant. It is in the neighborhood, maybe 150 feet, from the tanks. It is built of brick.

Over on the right hand side of the picture there is a building or shed. It is a one story frame building. I should judge it is 100 feet, maybe a little more, from the tanks.

[fol. 243] The west tank was gasoline and the east tank was coal oil. There was no crude oil in either one.

The building to the farthest left hand side of the photograph is the brick company's office. It is brick.

The flame was going with the smoke, carried by the wind. It wasn't a continuous blaze; the blaze would ignite around in the smoke at different spots. It seemed to light up occasionally away up in the smoke, maybe 50 feet high.

"Q. Did these tanks burst at all, anywhere?

"A. No."

Around the bottom of the tanks it was oily. There was some oil in the ware house, barrels of hard oil and stuff like that. That melted and ran around on the ground. The oil ran a little Northeast from the tanks, down to the switch track, I should say about 25 or 30 feet; it was burning.

Besides putting water on the tanks and sur-ounding property, the men took their shovels and made an embankment to keep the oil from running down.

"Mr. Doran: The plaintiff, the Sinclair Oil Company, separately objects to each separate question and the answer made thereto by the witness as incompetent and improper to prove or disprove any issue in this case, in that the character of the tanks as to their safety and whether they come within the police power of the city of Marysville, I mean the tanks located at Marysville, can't be proved by individual instances of fire in other places, and particularly there is no evidence to show that the physical conditions or character of construction of the tanks and the equipment or the method by which they were managed and operated is the same as or similar to those at Marysville; that is, there is no evidence to show that the Fort Scott tanks were the same as the Marysville tanks, and the plaintiff for all reasons stated, now moves the court to strike out any questions and answers of the witness relative to this fire.

"Mr. Evans: The Standard makes the same objection.

"The Master: Overruled at the present. The testimony will be received subject to the objection.

"Q. As part of the witness' direct examination, we offer defendant's Exhibits 5 and F. heretofore marked for the purpose of identification.

"Mr. Evans: Our objections lie also to the exhibits? [fol. 246] "The Master: Yes."

NOTE. The Clerk will here insert Exhibits 5 and F.

Cross-examination.

By Mr. Evans:

I have been Fire Chief of Ft. Scott about nine years. As fire chief have made a report to the city. I included this fire in my report, I did not describe it as I have on the stand here. The report does not require that. During the nine years mentioned there has been just one fire of oil tanks or warehouse, and during that time we have had an average of about 125 fires a year.

Redirect examination.

By Mr. Colmery:

The population of Fort Scott is about thirteen thousand.

M. WEHNER, a witness called by the defendants, testified as follows:

(Tr. of Testimony, pp. 388-396)

Direct examination.

By Mr. Colmery:

My name is M. Wehner, residence 3436 Broadway, Kansas City, Missouri. My occupation is meat cutter. I once worked for the Standard Oil Company under Mr. Love, who had charge of the tank routes delivering oil and gas at Hays, Kansas. I think that was 1917. I don't remember whether I worked there in 1919, but was there at the time the explosion occurred.

My duties were to sell all the gasoline and oil I could. I delivered by Ford truck that had a tank on it. I sold quite a bit of it. The truck had three tanks on it. Each tank was supposed to hold 100 gallons of oil or gasoline. There was a wing on each side on which I could carry a barrel of oil or gas, or cans of oil if necessary. It was one tank divided into three compartments. The gasoline was put in the tank wagon through the screw top. There was an extension from the pipe in the inside going over, and that had a galvanized pipe sleeve to run over that to extend it to the tank. I loaded my tank wagon at Hays, Kansas, at the property of the Standard Oil Company. The warehouse there was a building, in the center of the building there was a driveway like through a hay barn, a door at each end, west and east end, and on the sides of the building there was platforms on each side, to the north and south of the driveway, that contained barrels of oil used for storage. These platforms were about 2½ feet from the ground.

[fol. 247] There are oil tanks there. The large ones on the outside on the south side of the building that held the storage tanks. There were three large tanks. They didn't lie on the ground, they were sitting on heavy timbers and concrete. "No, I have forgotten what it was." All three of them were horizontal, "laying down." I should judge one tank was laying about ten or twelve feet away from the other two that were lying together, something like that.

"Q. To get this clear, I don't know—locate your warehouse on that piece of paper.

"A. Here is the warehouse, and here is one tank, if I am not mistaken, and back here was the other two, now, if I am not mistaken, that is about the way it was."

This is west and this is east. The tank which lay south of the warehouse was, I should judge, eight feet outside of the building. As I remember, the pipe came in about the center of the warehouse here for loading. Then it came about four feet from the south wall, to where it came in from the wagon. Then it came up and had another pipe on it and turned around, and then we extended our sleeve to run into the truck. That was an overhead carriage but I don't remember whether that was fastened on the center

of the side of the tank. Three feet from the foot of the platform where the pipe came up there were faucets to shut off.

The first thing I would do when I wanted to load the truck was to extend that sleeve, open the top of the truck, and the next thing would be to open the faucet that I wanted, inside of the warehouse about three feet above the platform where the faucets were. If we had gravity enough we filled it (that way), if we didn't we pumped it. There were valves outside right next the bottom of the tank. If there was enough oil in the tanks so that it would force it into the wagon tanks we wouldn't have to pump. If we didn't have enough we attached the handle to a pump and go to work. It was about two feet and a half from the edge of the platform next to the tanks, right next to these faucets.

"Q. Now, then, do you have some recollection of a fire of some nature at the premises along in the year 1919.

"Mr. Doran: The Plaintiff, the Sinclair Oil Company, objects to any inquiry relative to any fire, for all the reasons heretofore assigned to this character of the testimony, as incompetent to prove or disapprove any issue in this case, and all those objections heretofore that have been made to testimony of this kind are renewed.

[fol. 248] "Mr. Evans: The Standard makes the same objection.

"The Master: Same ruling.

. . . . . .

"A. Yes, sir."

I don't remember the day of the week. The first thing I knew of it I went down early in the morning about daylight, had several long trips in view, to fill up the tank wagon. I went in that storage room—the tank wagon was in there. I opened the doors on both the east and west ends. The next thing I filled up, then after I got filled up I closed the east door and started to crank the car, "and, pftt! all I know it was gone; all I knew, it was in flames." The truck was in flames.

"Mr. Doran: We would like to have the record show that the objections made to this evidence stands to each question without repetition."

The flame was underneath the truck. I didn't stop very long, I jumped in the truck and tried to back it out, but hit the corner of the building with one of the wings of the truck, and by that time the flames had spread on the platform so I couldn't get out. I didn't look to see what was burning, I was getting out. I believe I went into the east end of the building and forced myself out. I was about choked then from smoke. By the time I got around there got out of the truck—it was lucky I got out of there. I don't remember a thing of the fire at all after I got out. The next thing I remember, I was home lying down, resting.

"Mr. Doran: The plaintiffs renew their objection to each and every question and answer relative to this fire and ask that it be stricken out.

"Mr. Evans: The Standard makes the same objection.

"Mr. Doran: I included the Standard in my objection.

"Master: The same ruling."

Cross-examination.

By Mr. Evans:

I opened both doors, east and west. While I was filling the tank both doors were open, one front and one behind the truck. That was the instructions of the company. I had read them and knew that the purpose was to make a circulation of air that would dissipate the vapor. The last [fol. 249] thing after I got my pipes connected I opened the valve that led to the tank. I closed it before I closed the inside one that morning. I made a written statement about this and swore to it on the 18th day of November, 1919, shortly after the fire. My recollection was pretty good then.

"Q. Just as good as it is now of what occurred at the fire. It was just as good then as it is now?

"A. I don't think so.

"Q. Didn't you at that time make this statement: 'I then jumped into the cab of the truck, attempting to back it out of the building, as the door in front was closed and latched and had not been opened that morning.'?

"A. I don't recollect that it had not been opened.

"Q. Did you make that statement.

"A. I don't recollect that.

"Q. Didn't you also make the statement: 'In my excitement and confusion I do not think I closed the cut-off valve and was so dazed I couldn't remember any details.'?

"A. I am pretty sure I remember closing it, the rules were right there and I was instructed either by you or the auditor that goes around—

"Q. Had I given you many instructions?

"A. No, I never seen you before that."

Witness looked at plaintiff's Exhibit O, handed him by Mr. Evans, and said: "That is my signature, yes sir."

"Q. Calling your attention now to the statement at the close of the first paragraph: 'I didn't close the cut-off valve of the storage tanks because I expected Mr. Love at any time with his truck.'

"Mr. Bennett: We object to any testimony from this paper until it is offered in evidence.

"The Master: Overruled."

"Q. Did you make that statement?

"A. I sure must have, according to that.

• • • • • • •

I am trying to think straight, but the way conditions are with me now, Mr. Evans, since then, I don't think that, well, my mind is not exactly where it ought to be, and I can't think too fast, if you push me too much I do—Well, Mr. Simms, you was there when I made that statement—I think I did make that statement but I really don't remember much about it.

"Q. We offer that in evidence as plaintiffs' exhibit.

[fol. 250] "Mr. Bennett: We object to the introduction of the paper in evidence.

The Master: Overruled.

"Mr. Evans: I will not read it now, I only want the Master to notice the parts to which I called particular attention."

EXHIBIT "O"

"Hays City, Kansas, Nov. 18, 1919.

Affidavit of Michael Wehner

"I was born in Germany May 30, 1873, came to America when I was a child, do not remember the exact date.

Have been a resident of Hays City, Ellis County, Kansas, since 1892. I was employed by C. H. Poffenberger at Hays, Kansas, as motor truck driver in the spring of 1919 and continued in his services until August 11, 1919. At that time I was employed by Mr. J. J. Love who was Mr. Poffenberger's successor, as agent of the Standard Oil Company. I continued in his employ as truck driver and on November 17, 1919, I arrived at the Standard Oil Company's plant as usual for the purpose of filling truck tanks in order to take care of the usual day's business. This was 7 o'clock A. M. All compartments of the truck were empty, truck having stood in driveway of oil house since Saturday afternoon about 5:30, November 15, 1919. I first opened check-valve of tank No. 1 containing refined oil, and then No. 2 containing gasoline, and returned, to the oil house for the purpose of filling the tank on truck. I opened the quick-acting throttle valve which is about four feet from end of fill-pipe, allowing the gasoline to flow into the front compartment of truck tank by gravity, as the storage tanks were so full that it was not necessary to use the hand pump, filling this compartment within two inches of the top with gasoline. I then filled the rear compartment with refined oil in the same manner and within the same distance from the top. I did not fill the middle compartment as I wanted to see the agent, Mr. J. J. Love, to ascertain the condition of this compartment as I understood it to be in bad order, leaking slightly. I am positive that no oil and gasoline was spilled on tank or truck. I did not close check-valves at storage tanks, No. 1 and No. 2, because I expected Mr. Love any moment with his truck for the purpose of filling same. [fol. 251] At about 7:15 A. M. I attempted to start the motor of the truck as usual. I gave the crank two one-

quarter turns and then spun it over with spark retarding as we usually crank the motor on cold mornings off the batteries. At my third attempt the motor commenced running and instantly a flame shot out from in under the front end of the truck. I then jumped into the cab of the truck attempting to back it out of the oil house as the door in front of the truck was closed and latched and had not been opened this morning.

In my excitement I only moved a short distance to the rear stalling the motor of the engine. Instantly the flames began to spread around me and I jumped out of the cab and to the door that was closed for the purpose of getting out as it was impossible for me to get by the truck and through the open door. After great effort I forced an opening through the closed door and ran from the burning building. In my excitement and confusion I do not think I closed cut-off valves at storage tanks and was so dazed and overcome that I cannot remember any details for some time afterwards.

The truck referred to in this statement is a one-ton Ford which had been in operation for eight or nine months and was equipped with the Holley carburetor attached to motor. This carburetor had been leaking but was repaired Saturday morning Nov. 15, 1919, by myself and agent Love. I do not know if it was leaking this morning. The tank on this truck was a three-compartment one, each containing approximately 106 gallons. I did not receive any personal injuries during the fire.

Michael Wehner.

Subscribed and sworn to before me, a Notary Public, in and for Ellis County, Kansas, and I have hereunto attached my hand and seal this 18th day of November, 1919. Hugh C. Ford, Notary Public. My commission expires May 19, 1923. (Seal.)"

Redirect examination.

By Mr. Colmery:

"Q. Do you remember who got this—what they call a written statement, marked Plaintiff's Exhibit O—do you know the name of the man that interviewed you?

"A. Was you there, Mr. Edwards? And somebody else with you, I don't remember.

[fol. 252] "Q. Was it at the house?

"A. I know it wasn't at the house, it was in Hays somewhere, was it at the Brunswick Hotel? I couldn't remember."

I don't know whether or not the man who procured the statement purported to be a representative of the Standard Oil Company or was representing it. I don't remember.

I closed one of the doors after I was ready to go out, the one at the east side, and then I cranked the car. I do not remember whether it was a week or two weeks or three weeks after the fire before I went to work again. I didn't have good success after I did. I went back to work for the Standard Oil Company at the same work. I remember one leak underneath the tank wagon, where we carried the coal oil, where the pipe was fastened, but it was fixed some time before that. Mr. Love had it fixed. It was quite awhile, I think two or three weeks before the accident. That morning I had filled the compartment in which there had been a leak. I filled all three compartments. At least I think I did. I am not positive. At least that was my intention. I don't remember that one tank was empty. I can't remember that, but I am under the impression that I should have filled all three, in order to sell all the oil I could.

"Mr. Evans: We want to renew the motion as respects the redirect examination and move to strike it out.

"The Master: Same ruling.

"Mr. Evans: Exception."

James Joseph Love, a witness called by the defendants, testified as follows:

(Tr. of Testimony, pp. 396-414)

Direct examination.

By Mr. Colmery:

My name is James Joseph Love. Residence, Hays, Kansas. I am a truck driver, employed by the Home Oil Com-

pany of Hays. Have been with that company about three years and nine months. I was employed by the Standard Oil Company in 1919 as station man. I was agent at Hays, Kansas.

Under my employment by the Standard at Hays my duties were to look after the coal oil, gasoline, etc. of that company. I delivered these commodities myself. I had Mike Wehner working for me at that line of work. He drove a truck wagon. I had one other man, I drove a truck wagon myself. I got the gasoline and other products delivered by tank wagon from the storage tanks of the Stand- [fol. 253] ard Company; they were located out towards the east side of Hays, on North Main Street. I was agent or sub-agent at Hays about nine months.

"Q. Do you recall a fire and a rupture of the tank out at Hays, Kansas, along in the year 1919?

"Mr. Doran: The plaintiffs, each for itself, object to all questions that may be asked relative to the alleged fire at Hays, as incompetent to prove or disprove any issue in this case, in that the circumstances surrounding this fire were not the same as those prevailing in Marysville. The fire in the tanks—the tanks are not the same as those at Marysville, that there is nothing to show that the physical facts, equipment, manner of operation of the Marysville tanks and the manner of operation and maintenance of them is similar or the same as the conditions prevailing at the time of the fire at Hays. For all of these reasons, this evidence is incompetent to prove the character of the tanks or manner of operation, now located in Marysville.

"The Master: Overruled for the present; the testimony is received subject to the objection.

"Mr. Doran: Exception."

There were three horizontal tanks at Hays, lying parallel to the ground. There was a warehouse and a little lubricating oil in it. There were no other structures in the nature of buildings.

"Q. I hand you a plain white sheet of paper, marked Defendant's Exhibit 6, this being the paper which Mike Wehner has sketched on the location of the warehouse and tanks as he recalls them. Now, there is an enclosure there marked "1" which Mr. Fehner said represents the warehouse on

that property. Now, was there a driveway in that warehouse?

"A. Yes.

"Q. And which way did this driveway run through it?

"A. East and West."

It was about in the center. There was a pump on the south side and a few oil barrels on the north side. There were platforms on both sides; motor oil and grease were kept stored in this warehouse. The grease was in cans and pails, the oil in barrels, five gallon cans. There was a loading pump through which the tank trucks were loaded, about center ways, a little closer on the west side. The loading device was on the south side of the driveway. Two of the storage tanks were on the south side of the warehouse and [fol. 254] one on the east end, in the Southeast corner. Then this diagram here (Defendant's Exhibit 6) which represents No. 2, No. 3 and No. 4, does not represent the location of these tanks. Two set east and west on the south side, and the one at the northeast corner laid north and south.

"Q. Suppose you take this corner of the paper down here, which is marked Defendant's Exhibit 6, and sketch on it the tanks and warehouse on a small scale. Now, each little figure that you have so artistically drawn there, put a little number by them, beginning with 1. * * * [The wa]

"A. The warehouse on the north side—the warehouse is 0, and the——

"Q. Refer to it as No. 4, please. The warehouse is where with reference to the tank?

"A. On the north side.

"Q. And that is marked No. 4?

"A. Yes.

"Q. Where are the tanks with reference to the warehouse?

"A. Setting on the southeast.

"Q. How many are there?

"A. Three.

"Q. What have you marked there No. 1 and No. 2, do those tanks run east and west?

"A. East and west.

"Q. How far was it from the tanks to the warehouse, as nearly as you can tell?

"A. Somewhere about ten feet.

"Q. Are there two tanks, numbered 1 and 2, apart from each other?

"A. About two feet."

The capacity of each tank was about 10,000 gallons. There was coal oil in one and gasoline in the other. I am not positive which. Tank No. 3 contained gasoline, it was about 15 feet from the warehouse at the nearest point; it was about four feet from the nearest point of the other two tanks. There was nothing between tanks 1 and 2 and the tank No. 3. Tank No. 3 was 10 x 30 feet, I don't know the capacity. It was a third larger than tanks 1 and 2. I suppose it would hold about 20,000 gallons.

I loaded the truck wagon in the warehouse. I got the gasoline from the tank into the warehouse by pump located in the warehouse. We had two pumps, operated by hand and by motor. We could work them either way. We loaded the tank wagons from the storage tanks by pump. We would take the top off the tanks and put the down spout into the tanks on the top, in the hole from which we took the cover. Then we would pump it full. We had to open the valves to get it in. The valves were located inside and outside of the warehouse. We had to open the valves in loading. We opened the outside one first and after the [fol. 255] truck was loaded closed the inside valve first to keep the gasoline from running out.

I wasn't at the station sometime in the month of November, 1919, when there was a fire there. I was around there.

"Q. How close were you to it?

"A. 300 feet."

I wasn't there in the morning when Mike Wehner filled the tank wagon. I wouldn't be positive whether there was a manhole cover on tanks 1 and 2. "They had a small plug in number 1 and 2 and I never looked any further." They have vent devices on these tanks, just a hole in the end where I measured through, with plugs in them. They were on top of the tank. There was one vent on each tank. These were the two smaller tanks. I measured gasoline through these vent holes on these two tanks.

"Q. I hand you a paper marked Plaintiff's Exhibit B, with a photograph. Does that look anything like the devices on the two tanks. Look at it carefully.

"A. Not on 1 and 2.

"Q. Now, then, with those in mind, tell what kind of devices were on there?

"A. There could have been those kinds, they had no top on them, but had wooden plugs in them."

There wasn't any pipe in connection with them at all, it was just a hole right in the surface of the tank. There could have been a pipe in there, inside, but none on the outside. There was a manhole on top of tank No. 3, it was about 18 inches across, in diameter; then it had a small vent in it, located on this north end. Exhibit B. represents the kind of vent in that large tank. It had a lid on it.

"Q. Tell us what kind of a lid it was.

"A. I don't know what kind of a lid it was. I never paid any attention to it.

"Q. Do you know how it fit, whether tightly or loosely?

"A. No, sir.

"Q. Did you ever look inside of it?

"A. No, sir.

"Q. Do you know whether it was screwed in or fit down the top?

"A. No, sir."

The first knowledge I had of the fire was when the fire whistle blew. I was just starting from home to work. I went on down to the warehouse. When I arrived there it was all afire. I got within 300 feet of the warehouse. I didn't see the truck wagon at any time. I heard explosions, loud reports, while I was there. There were some oil bar-[fol. 256] rels there that blowed up about 20 minutes or more after I arrived at the scene of the fire. There was some noise in that connection. The barrels kept blowing up there, and the building went down finally, it collapsed and the tank got afire. All three of the other ones caught fire, the larger one first. There was a volume of smoke emitted from the large tank as it burned; it burned about two hours and then blew up. I saw it when it started. It moved lengthways, north. At the time I was standing on

the west side, about half a block away. The tank lit about two blocks north. When it went it was all done. The other tanks were afire before it went. There was some noise in connection with the fire, "a kind of swish, hissing." The tanks appeared to be burning all over. The large tank bursted. The two small tanks burst at the bottom where the outlet is, at the end at the bottom. I was about half a block away watching them burn. After the large tank went about two blocks north there were several little houses burned. At the Standard property the warehouse was all ashes and tin. The two tanks were about half or two-thirds off the foundation. There were holes in both of them. Tank No. 1 had a hole at the bottom. There was a two-inch hole in it. It was round and cracked across the seam. Tank No. 2 had a two-inch hole in it; that was cracked at the end at the bottom. That tank was bursted along one side a little, on the end and side, leaving a hole. I didn't pay any attention to how large it was.

The tank wagon Mike Wehner was using had a leak. I had made no effort to fix it. "It blowed up or burned up." I saw what was left of it afterwards in the warehouse. It looked like a bunch of tin and iron. There was nothing left of the stuff that was stored inside the warehouse but the empties, the iron was burned down.

I was not at the fire during all the time after I went down, up to the explosion. I was back at home, up town and back again. It burned about three hours. The fire started about fifteen minutes after seven in the morning. After the fire the remains of the truck wagon was on the driveway where the warehouse was located. The whole thing was in the driveway.

There were flames in connection with the burning of the three tanks, which shot up into the air about 200 feet. They shot up just all in a bunch. One of the tanks exploded, it threw the gasoline or liquid contents over the surrounding territory, I don't know how far. The fire [fol. 257] was communicated to the Farmers Elevator, which was straight south about 80 feet. It burned up completely.

Fire was communicated to two dwelling houses on the north of the Standard property. One about 100 feet north, the other about two blocks north. The house burned about

two blocks north was where the large tank finally rested. I don't know whether it hit the house or the foundation. I believe it did. The house was burned up. I don't know whether it knocked it off (the foundation) or not, I don't think it did. I was up there after the fire was all over, at the house and the oil station. The house was burned clear down. The tank was 40 feet from the house when I saw it. I am not sure whether it had been moved but I think it had. As this tank moved there was a noise—what is commonly termed concussion—just a loud roar—a loud, deafening noise. There was a jar which jarred the ground all over town.

Cross-examination.

By Mr. Evans:

"This plant was on the right of way of the Union Pacific Railway, wasn't it?

"Mr. Doran: Plaintiffs renew their objection to each and every question advanced covering the fire and explosion at Hays as incompetent to prove or disprove any issue in this case, and ask that it all be stricken out as stated in our former objections.

"The Master: Same ruling.

Mr. Doran: Exception."

The Standard Oil plant was on the right of way of the Union Pacific Railway Company, so was the Farmers Elevator but directly south of the Standard Oil Company.

I am not now employed by the Standard. I am employed by the Home Oil Company, a competitor of the Standard Oil Company at Hays. I have been employed by the Home Oil Company about three years and some months.

G. L. Fenwick, recalled for further direct examination, testified as follows:

(Tr. of Testimony, pp. 414-429)

[fol. 258] Direct examination.

By Mr. Bennett:

"We offer in evidence paper marked Defendant's Exhibit 6, being plats made by the witness (Wehner and Love)."

The Clerk will here insert copy of Defendants' Exhibit No. 6.

"Q. A matter about which we forgot to inquire, I would like to ask you about, Mr. Fenwick. Do you know what the cost was to bury your tanks at Marysville?

"Mr. Doran: We object as immaterial.
"The Master: Overruled.
"Mr. Doran: Exception.

"A. Well, I don't remember exactly what it cost for the others, the ones already buried, but I have been contemplating burying another tank, and I have the cost on it. It is a 10 x 20, which holds approximately 11,750 or 60 gallons.

"Q. What would it cost you to bury that tank?

"Mr. Doran: Same objection.
"The Master: Overruled.
"Mr. Doran: Exception.

"A. $695.00."

The gauge of the iron is a quarter (inch), called copper steel.

"Q. Do you know what it would cost to erect a tank of similar capacity, a vertical tank, at Marysville?

"A. Do you mean the same gauge?

"Q. What I mean is one similar to the Sinclair tanks there, that kind of tank?

"A. Yes.

"Q. What would it cost?
"Mr. Doran: We object as immaterial.
"The Master: Overruled.

"A. $385.00.

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"That includes the tank laid down at Marysville on its platform, a concrete base, in place, erected.

"Q. Do you know what it would cost to erect a tank of that approximate capacity similar to the installation that the Standard has at Marysville, on concrete piers?
[fol. 259] "A. No, I don't believe I would, I don't know how much concrete, how large a base, would be necessary."

The quarter inch tank laid down at Marysville would cost $519.00. You would have to add to that the cost of construction of the concrete piers. The figures I gave, $695.00 (for a buried tank) included the cost of the tank laid down at Marysville, the hole dug, the tank placed and the tank covered. I didn't figure the piping to any of them. The last of the three tanks I have buried would cost practically the same amount, $695.00. It possibly was $20.00 more, tanks were a little higher at that time.

Cross-examination.

By Mr. Doran:

A 10x20 foot, ¼ inch guage, would cost $519.00. The tank is painted when it comes. I didn't put any tar or finish on them. I didn't figure any concrete base to keep it from sinking, settling and breaking the connection. I think I could do the whole job for $695.00. The fellow agreed to dig the hole and put it in for me, he put in the other tanks and I am figuring on the same basis.

"Q. Have you figured what the loss would be to the company which has tanks already erected above ground in use?

"Mr. Bennett: We object as not proper cross-examination and furnishing no basis for relief in equity in this suit.
"The Master: Overruled.
"Mr. Bennett: Exception.

"A. Well, no, I have not."

I would think the tanks the Sinclair has up there could be buried. If they cannot be buried they would have to be junked, or used elsewhere. If it is unlawful to use them above ground in Marysville, I suppose it ought to be in other places.

I didn't figure the pipe line connections in the item of $695.00; didn't figure that on either of them. I figured and included the cost of the manhole, it is laid in brick, jug shape. If three tanks were buried, I judge it would cost less, if you dug the hole big enough to put in three. I put two together, about a foot or a foot and a half apart. They have no concrete foundation to keep them from settling, they are set on hard clay. The clay didn't appear to be softer at one end than the other so that the tank might [fol. 260] settle at the soft end and break the connection, or spring a leak in the seam. I am pretty sure that the soil there is not sandy, it is clay. I think that if two tanks were buried the cost would be about $1,400.

I don't know how many storage tanks there are in Kansas above ground, or how many the Standard Oil Company has.

The first two tanks I buried I hired men and dug the holes myself. "I had six or seven different men, I might possibly name them. A fellow by the name of George Butler done most of the blasting."

Redirect examination.

By Mr. Bennett:

The Hall Bros. buried my three tanks. It is with the Hall Bros. I have a contract now to bury another tank, to dig the fourth hole. The contract was made about 30 days ago, about a year after they got through with the other tanks. I didn't set the tanks on a concrete base, it was clay ground, solid. We didn't think it was necessary. I didn't include the cost of piping as it takes practically the same piping and appliances as it does for tanks above ground. The cost would be approximately the same.

Recross-examination.

By Mr. Doran:

I suppose that a corporation that has tanks already in use and which can't be buried, that whatever they are worth in use would be lost if they had to bury the tanks.

Frank King, a witness called by the defendants, testified as follows:

(Tr. of Testimony, pp. 420-436)

Direct examination.

By Mr. Colmery:

My name is Frank King; residence, Hays, Kansas. I am engaged in the stock business. Am Deputy Fire Marshal at Hays and Chief of the Fire Department. Have occupied the latter position about 25 years and Deputy Marshal about 15 years.

Am familiar with the location of the property of the Standard Oil Company in the city of Hays. I recall a fire at that property some time during the year 1919. Was familiar with the property and its character prior to that fire, and have been since. I prepared Defendants' Exhibit 7.

[fol. 261] "Q. What does it represent?

"Mr. Evans: We want to interpose here at this time the same objections that have been interposed to testimony of each witness respecting fires or explosions at points other than Marysville for the reason that the same are incompetent, irrelevant and immaterial, and do not prove or tend to prove or disprove any issue in this case. That applies to both companies.

"The Master: Same ruling.

"A. It (Defendants' Exhibit 7) represents the Standard Oil Company's tanks, Union Pacific Railway, streets around the tanks, Farmers Elevator, houses that burned, bodies of dead people."

This exhibit is not drawn to scale. The property of the Standard Oil Company is bounded on the west by Oak Street, on the north by North Main, on the south by the Union Pacific right of way, on the east by Pine Avenue.

"Q. What is the approximate distance between the tracks of the Union Pacific and North Main Street?

"A. North Main Street is about forty-five feet wide, and then the railroad right of way, I don't know how wide that is."

The Standard Oil Company property is on the right of way; it is about 125 feet from the south edge of Main Street to the tracks of the Union Pacific.

As Fire Chief and Deputy Fire Marshal, I made an investigation immediately after the fire, a week or a week and a half, or two weeks. Frank McIvor, from the office of the State Fire Marshal, was with me.

The fire was November 17, 1919. The first thing I knew about it, I was called at home, five blocks from the fire, at 7:05, I think it was. I lived three blocks east and two blocks south of the Standard plant. I went to the barn and got my horse and went to the fire. I got to the alley north of Main Street, west of Pine Avenue. I found the alley full of people, told them to get out of there and get back. Went out west to Oak Street, straight through the alley. I turned south on Oak Street and asked the people to get back. There were a great many people there. I came down east on Main Street to a point about 50 or 60 feet from the warehouse of the Standard Oil Company, west. The warehouse and one tank were afire. That was the north tank of the [fol. 262] smaller tanks. There are three tanks there shown on this, Defendants' Exhibit 7. A truck was coming along, a fire company truck, and I ordered them back to the alley. They were going east on North Main Street; and I ran a line of hose on Oak Street down the alley to North Main. Came in the alley up on North Main Street and played water on buildings and box cars. Located the hose on North Main Street about 60 feet northwest of the warehouse. One of the men said it was too hot to stay there, so I got some grain doors and put them in front of the boys.

I went to the Farmers Elevator south of the Standard Oil tanks and south of the Union Pacific tracks. That is shown on Exhibit 7. I got on top of the warehouse of the elevator. It was very hot and endangering the Farmers Elevator, at that time it had caught the second tank; the second tank would be on the south. There were two tanks on fire at that time, there had been an explosion. "One was a tank wagon in the warehouse." At that time I was out in Oak Street, I had asked the people to get back and they wouldn't, finally when that exploded they did get back. The end of the tank wagon came about 150 feet out of the warehouse, west, towards me, toward Oak Street.

Over at the elevator I tried to keep the elevator from burning. Asked for volunteers to go up on top with me and two men volunteered. I went up, played on the fire and tried to put it out, and then heard a roaring, sizzing noise, went to the edge and looked down on this big tank. It had got kind of white heat over it and around it, and was swishing, and then it started to sway and rock. I was on top of the elevator, looking down over the tank, 82 feet away. I have measured it. The noise got greater and I said to the boys: "It is time for us to move." The noise was a sizzing, whistling noise. As soon as I hit the ground I went into the office of the elevator and asked them if they had any books or records they wanted to save, and while we were in there the explosion occurred. The north side of the elevator and the roof of the elevator came in. The end of the tank hit the elevator. How it got there God knows, I don't.

I come out and looked north, and I saw some people gathering several bodies up, north from where I was. That would be north of Second Street. I ran over there. Second Street is about 300 feet from the property of the Standard Oil Company. When I went over north of Second Street I found six bodies; they were right off of Second Street, [fol. 263] lying off the edge of the sidewalk. All mangled, heads blown off, arms blown off, legs and feet blown off.

The tank hit a small house right across the alley on Second Street, north. The house began to burn. It also hit a tree and the eaves of a house on the south side of Second

Street. The tree was a locust tree about 8 or 10 inches through, it bent it over and broke it. The house hit by the tank was straight north from the tree, about 225 feet north. The tank laid crosswise and the house vertical. The house was a structure about 22x16, resting on its cement foundation. The tank made a mark in the ground and lit south and right at the edge of the house just across the alley. It tore the eaves off a house right near the locust tree.

There appears on Exhibit 7 a small building located immediately north of Main Street. This is Mrs. Smith's house. The X marked on plat right north of that indicates a man by the name of Turtle burned there. I saw him on top of Mrs. Smith's house in the course of the fire.

I am familiar with the Standard Oil property as it was before and is now, at its location in Hays. There were two tanks about 8,000 gallons each lying about two feet apart, possibly three feet, on cement piers, laying horizontal, with a woven wire fence around them.

I examined the manhole since then on the large tank. I examined it at Frank Brown's farm, seven miles east of Hays. Half of this tank was used for a granary, it still had the manhole on, the cover is screwed in, and the other part is junk. It has a hole about an eight-inch hole, and its cover was screwed in, and then it has a smaller hole at the end, about a two inch hole, and it showed something was screwed in there, had threads. All of these were on the top surface.

The Home Oil Company had unloaded two tanks east of the Standard premises prior to the time of the fire. They were right off east about, I should judge, maybe 10 or 15 feet, unloaded from the side track and laid there. After the fire they were in a burned condition, one was crushed and the other mangled. It was like you would step on the end of a tin can. After the fire they were about 50 or 60 feet, or something like that, from the place where they had been lying, on the ground. They were blown there as the result of this explosion.

There was hardly any wind blowing that day. I made some measurements to show how far the large tank trav- [fol. 264] eled; it was 475 feet to where it lodged against the Piffer house. The fire burned the side out of one box

car on the Union Pacific siding, and the end out of the other. They were 89 feet from the Standard Oil Company tanks.

As a part of my duties as Deputy Fire Marshal I make a report to the Fire Marshal. I made a report of this fire. We report the value of the property burned, that is about all. We report the personal injuries to the state; I did that in this case. Nine persons were killed as a result of this fire and explosion. Anyway 25 were injured. I didn't keep count of them.

"Q. Did you have occasion to ascertain whether or not there were any property damages?

"A. Yes, sir.

"Q. How many of these?

"A. Seventeen. * * * Those destroyed in any way or form."

I would give as a rough statement that the damage amounted to between fifty and seventy-five thousand dollars.

Here counsel for the defendants referred to a booklet, the Seventh Annual Report of the State Fire Marshal, Kansas, 1917, and had the Reporter mark the same for identification, "Defendant's Exhibit 8." Referring to a picture on page 16 of Exhibit 8, witness testified in answer to the question,

"Does that look familiar to you?

"A. Yes.

"Q. Is that a fair likeness or representation of the surroundings at Hays, Kansas, which includes the tree about which you testified?

"A. The tree was broke down about the middle.

"Q. And how far from the ground did the tank hit the tree?

"A. The cave of a house would be maybe ten or fifteen feet south of the tree, and that cave was twelve or fifteen feet high."

The street shown in the picture runs east and west.

The picture at page 18 of Defendant's Exhibit 8 looks familiar. The mass or body on the right hand side of the picture are the Home Oil Company tanks which I spoke

about. That is just east of where the Standard warehouse was, almost on Pine Street.

The picture on page 19 of Defendants' Exhibit 8 is a large tank. It is located in Hays 475 feet north of the Standard Oil Company property. The foundation of the [fol. 265] Piffer house that burned is shown right there on the left. The south end of that tank shown in the left side of the picture was blown out.

The pictures on page 18 and 19 of Exhibit 8 show a fair picture of the large tank as it rested near the Piffer house, and the empty tank of the Home Oil Company as it appeared after the fire and explosion. These tanks during the fire split at the ends, broke down the seams, and were burned badly and left laying right there. I would call them worthless.

The elevator was a frame structure, at the east end about a three story building and on the west about sixty feet was a one-story room. The one story part was hit about the center of the building. It caved in the north side and raised the roof, the roof went up and then slid back, it broke the studding. Inside there were several carloads of flour, bran, corn chops, all kinds of grain, potatoes, and they were all thrown to the south.

"Mr. Doran: We ask to have all this evidence stricken out for the reasons already given.

"The Master: Same ruling.

"Mr. Evans: Same for the Standard."

Cross-examination.

By Mr. Evans:

I went down to the fire about 7:00 o'clock in the morning and it was at least an hour after that before the big tank exploded. During that time I tried to keep the crowd back, and got the assistance of several bystanders for that purpose.

The gasoline was not running out of the tank at the bottom, at the valve. One small tank was cracked in the seam. There was no gasoline coming out of the valve that

I saw at either of them. The manholes that I saw in the big tank were screwed in flat and tight. There was nothing fitted in the manhole that worked up and down; that was a solid cover.

"Mr. Evans: Now, the plaintiffs move to strike out all of the testimony of this witness respecting the fire at Hays concerning which he has testified, for the reason and upon the ground that his testimony shows that the tanks in question and at Hays were not equipped as the tanks of the plaintiffs at Marysville, and are not shown to have been operated in the same manner. That covers both companies.

[fol. 266] "The Master: Overruled at the present time.

"Mr. Evans: Note our exceptions."

Redirect examination.

By Mr. Colmery:

The fire burned about an hour until there was an explosion. The fire continued at the plant of the Standard Company, buildings and surroundings, altogether, about 2½ hours. In regard to flames and smoke, as I saw it there was a black smoke coming out like explosions, and the flames went through the smoke, the black smoke went first and then a flame through it. The flames went about 50 or 60 feet above the tank, the black smoke and heat indefinitely. There was a second or two between the flames, like the explosion of a carburetor on an engine flashes. The gasoline that came out of the crack in the small tank ignited as it hit the ground.

E. F. Bowman, a witness recalled by defendants, testified as follows:

(Tr. of Testimony, 436-439)

Direct examination.

By Mr. Bennett:

There is a sanitary sewer in the alley in block 40, that is 8½ feet deep. It is about 90 feet from the Standard Oil

Company tanks. I don't know how it is constructed. I have investigated the condition of the spur track that runs down through Block 40 and 71 with regard to ballast. There is cinder ballast on that spur from its junction with the main track down to the Bone-McLucas Coal sheds, those are the sheds fartherest south. They are in block 71. Beyond the coal sheds there is no ballast at all, along the spur track. The end of the coal shed extends south on the north property line, approximately 85 feet without ballast. The right of way joins the property of the Sinclair Oil Company. There is no ballast directly east of the Sinclair tanks on the spur track, the ties are filled with black dirt shoveled from the sides.

That coal shed is painted, it looks like it was painted when it was built, about a year or two ago. It is not a very old shed. The coal shed in block 40 is an old building with no paint on it, in pretty bad shape, very dry. I think practically every bin is full of coal right now. Those are the only places these two companies, the Bone-McLucas Company and the Thompson have for storing coal.

I don't know how deep the cinder ballast in block 40 is. I don't know how deep underneath the ties, but it is both [fol. 267] cinders and Sherman Hill gravel there as ballast through block 40. That part of the town down about blocks 40 and 71 is comparatively level, very little slope either way.

Here defendants offer in evidence defendant's Exhibit 7.

"Mr. Evans: We have no other objection than the general objection to all this testimony.

"Mr. Colmery: And the portions of Defendants' Exhibit Eight which have been identified by the witness King, shown on pages 16, 18 and 19, but referring to the photograph and pictures only.

"Mr. Evans: The same general objection to each of these that we have lodged to all of this testimony about the different fires.

"The Master: Same ruling.

"Mr. Evans: Exception."

The Clerk will here insert copies of Exhibit 7 and the pictures shown in Exhibit 8, at pp. 16, 18 and 19.

JAMES W. CAMPBELL, a witness called by the plaintiffs, recalled for further cross-examination, testified as follows:

(Tr. of Testimony, 440-445)

Cross-examination.

By Mr. Bennett:

The last advices I have on the rate on the Standard Oil tanks in Marysville is a dollar forty-six and seven mills for one hundred dollars insurance. On the Fenwick tanks it is seventy cents and three mills. This to the best of my knowledge is the latest premium rate. The fire insurance rates of the State of Kansas are published by the Kansas Inspection Bureau and that rate is required to be used by all insurance companies doing business in the state. All companies that are licensed by the insurance Department must use these rates. The rate I have just given is put out by the Kansas Bureau.

Redirect examination.

By Mr. Evans:

"Q. Pick out some particular property just to show the general situation, that the rate on oil property isn't as high as on grocery stores, for instance.

[fol. 268] "Mr. Colmery: We object as incompetent, irrelevant and immaterial, not tending to prove any of the issues in the case.

"The Master: Overruled.

"Mr. Colmery: Note our exception.

"A. I would like to explain the rating of these Sinclair Oil Company tanks and the Fenwick tanks, and that is, that the rates quoted cover buildings and structures of all kinds as well as tanks. The buildings at distributing stations will take by themselves rates from $3.00 to $4.50.

"Q. That is a higher rate than the tanks?

"A. Yes, very much, and the tanks of the Sinclair and Standard Oil Company at Marysville could be insured for sixty-four cents, that is, as I understand this case, if they only insured the tanks. The comparison on Broadway, on

the south side, is a rating published in May or April, 1924——

"Mr. Bennett: Object as occurring long after the passage of the ordinance in question.

"The Master: Overruled.

"A. A cleaning and pressing establishment, the rate is $3.56; pool hall, $2.39; garage $4.05; plumbing establishment, $2.33; here is a building that contained a battery station, a lodge, a garage and a hotel, paint shop and office, the rate is $3.29. This is a building on the south side of Broadway, occupied as a general merchandise store, $2.45; a building occupied as a produce house, vacant, blacksmith, auto repairing, the rate is $5.85. * * *

"Mr. Colmery: May it be understood that the objection we made runs to each and all of the questions, we don't like to repeat it?

"The Master: Same ruling."

The rates on residence property in the vicinity of these tanks are not published. There are no buildings on which the rates are affected by the stations of the Standard and Sinclair Companies, none are close enough to be affected by them; they would have to be within fifty feet, if they are further than fifty feet away the rate is not affected by the pressure of the tanks.

"Q. Now, Mr. Campbell, you would say the presence of a tank holding five hundred or less gallons of distillate or crude oil, within from one to ten feet from a residence, would it affect the rate on a residence?

[fol. 269] "Mr. Bennett: We object as incompetent, irrelevant and immaterial, not tending to prove any issue in the case.

"The Master: Overruled.

"A. The tank containing 490 gallons of crude oil within ten feet of a dwelling will increase the rate of a dwelling—the amount of the increase being dependent upon the amount in the tank.

"Q. How about distillate or fuel oil?

"A. There would be a slight increase, but considerably slighter than it would if it contained crude oil.

Recross-examination.

By Mr. Bennett:

No rates on dwellings are published. I think they do rate them all. They don't miss them intentionally. The rate would be 64 cents on these tanks without the buildings; on the same basis the Fenwick tanks, if the rate was made by the man who made this rate, would be 36 cents. It figures out that way. The other rates I read were principally for buildings, I think I named one or two contents. The increase in insurance on a house with 500 gallons distillate tank at the rear of the house would be about three or four cents per hundred. The rate on crude oil or gasoline would depend upon the construction of the tank. The rate on buildings is affected by the matter of exposure. The rates read are on buildings in the business district of Marysville, they lay against one another. The fire insurance rates or circulars provide very severe charges for proximity of buildings with combustible walls, facing each other, or unprotected openings facing each other—much more severe than oil tank rates. Referring to building shown in the book as No. 97, the rate upon the building and contents is 95 cents on building and 1.15 on contents. The printing office there increases the rate over an ordinary [mer*c*hantile] building. No. 354 of the rate book shows a title or cement block building occupied as auto sales, $1.54 for the building and $1.85 on the contents. One reason that the rate might be lower is the fact that they have signed an agreement to use no gasoline inside the building; that does not show there. Some of the other buildings were buildings occupied by more than one person. The rate would be lower if it was off by itself, and also on all buildings separated from it. A garage among other buildings raises the rate on everything around it.

[fol. 270] EVIDENCE OF PLAINTIFFS ON REOPENING OF CASE IN CHIEF

W. R. TASKER, a witness called by plaintiffs, testified as follows:

(Tr. of Testimony, 445-456)

Direct examination.

By Mr. Doran:

My name is W. R. Tasker, residence, Herington, Kansas; I am Superintendent of the Water and Light Plants there. I have followed the same occupation for 20 or 25 years. I have been engaged in the management of water and light plant at Norton, Kansas, Tecumseh, Nebraska, and Herington, Kansas.

I have had experience in handling and storage of fuel oil at Norton, Kansas, and at Herington, Kansas. These oils were used mostly for power purposes at Norton, Kansas. It was stored in concrete reservoirs underground. I presume the one at Norton, Kansas, had a capacity in the neighborhood of 20,000 gallons. I stored fuel oil for similar purposes at Herington, Kansas. I have an opinion from my experience in handling oil which is safer and better—under or above ground storage.

"Q. State to the Master what your opinion is.

"Mr. Bennett: To which we object as no proper foundation having been laid, and the witness not showing himself qualified to answer, and for the further reasons that the conditions aren't shown to be similar to those at Marysville, Kansas, and the qualification—we don't think the witness has shown qualification.

"The Master: Overruled.

"Mr. Bennett: Please note our exceptions, and may I ask some preliminary questions?

"Mr. Bennett: Have you had experience in storing oil above ground?

"A. Yes, sir.

"Mr. Bennett: At the same place?

"A. Yes, sir.

"Mr. Doran: Is it safer below or above ground?

"Mr. Bennett: From that standpoint?

"Q. Which is more safe and proper?
"A. Personally I prefer above ground storage.

[fol. 271] "Mr. Bennett: We move that the answer be stricken out as not responsive.

"Q. State what your opinion is, what is your opinion as to which is safer and better?
"A. Above ground.
"Q. Now, what is your reason for that opinion.
"A. To eliminate leakage, contamination of our water wells and wells for domestic purposes.

• • • • • • •

"Q. What was your experience at Norton?
"A. At Norton we had seepage into the city water supply."

The underground storage tank there was, I judge, 10 or 12 feet below the surface. We had two tanks at Norton, they were of concrete. The oil seeped though to one of the city wells. The well was 100 or 150 feet from the storage tank. We had to quit using the water out of that well. We emptied the storage tank and repaired it for the time being. We tried it again; the well was abandoned at that time. After I left they abandoned underground storage and put in above ground tanks. I have been there since, the new tanks are practically 200 feet from any buildings. There is a warehouse probably 50 feet from the storage tanks, maybe closer.

We stored our fuel oil in concrete reservoirs, I would say from 60 to 65 gallons, at Herington. We experienced leakage in these reservoirs which contaminated domestic wells, I would say a thousand or twelve hundred feet, the other probably 150 feet, there were two wells. As a result we connected the persons who owned the wells to the city water supply and the city paid for the connection. The storage tanks for fuel oil underground were abandoned. They are now using steel tanks above ground. They are located possibly eight feet from the nearest adjoining struc-

ture, the brick power house for the electric light and water plant at Herington. This building is 40 x 80 feet, with a lean to built on, a pump house twenty-four feet square. It is perhaps 15 feet high, covered with built up roofing, one part with asbestos roofing. There is also a concrete wall, a settling basin for our filtration plant. We have a warehouse east of these tanks, possibly 150 feet, maybe 200 feet. We have been storing fuel in above ground tanks at Herington about two years. I have never had any trouble with it. We use 12 or 15 thousand gallons of fuel oil every month. Are doing that right along.

[fol. 272] We pump the contents into the tanks from tank cars. We have a pipe from the pump house to the track underneath the settling basin; the rest is above ground. We put that buried pipe down because there was no other place to put it.

My opinion is that above ground storage is safer and best because you can see to make repairs.

"Q. Do you know any way by which you can discover leakage on the underground tank?

"Mr. Bennett: We object as undertaking to prove a negative.

"The Master: Overruled.

"Mr. Bennett: Exceptions.

"A. No way, except as I have stated.

"Q. What is that?

"A. By contamination somewhere in the neighborhood.

"Q. Any way to discover underground leakage?

"A. Not that I know of.

• • • • • • •

"Q. Would it be safe, in your judgment, to bury a tank of any kind in a concrete basin, with chambers so you could get around, underground, to look it over?

"Mr. Bennett: We object as assuming a state of facts not shown in Herington or any place else, and he has not qualified himself to give an expert opinion on that.

"The Master: He may answer if he knows.

"Mr. Bennett: Note our exception.

"Q. I mean a fuel tank—containing fuel oil or gasoline?
"A. I wouldn't think it would be with gasoline.
"Q. Because of what, what reasons?
"A. Gas fumes would fill the chambers."
Owing to the fumes of gasoline which would fill the chambers; fumes would get in by evaporation.

Cross-examination.

By Mr. Bennett:

My experience with underground storage were with concrete reservoirs. I went down into the reservoir at Herington and thought we found where it was leaking. It seemed [fol. 273] to be pretty well all over the bottom of it; part of the cracks were in the bottom and part through the concrete. I didn't go into the one at Norton. The one at Herington was brick and concrete construction, I would judge the total wall thickness was possibly ten or twelve inches. It had been built for several years. I personally used it for a year. I presume the thickness of the concrete was about four inches and the brick six or eight inches. I think it was two courses of brick, and I think the oil soaked out there into the brick and into the wall. I think the concrete was eight inches thick with a 12 inch bottom. I measured the tanks every day, no appreciable leakage could be determined from the measurement. The depth of the water well at Norton was 60 feet. I can't tell the depth of the well at Herington, it was a domestic well. The trouble with the well at Norton was from distillate and the well at Herington fuel oil. I wouldn't think there would be any difference in the danger of fire between above ground and underground storage. If an underground tank was covered with three feet of earth, it would make a difference. I never had an experience with a tank covered with that much earth. If a tank filled with petroleum products was covered with three feet of earth, as compared with one above ground I would say that the overhead tank would be more dangerous from communicating fire. There is more exposure, the fire could get to it better. I think the three feet of earth would be a protection. I wouldn't think the fuel oil would be any different. If you take a high explosive or very inflammable

product there would be a difference. The underground wouldn't take fire as quickly.

There is very little evaporation and gas from fuel oil. Under the same conditions, except that one tank is above ground and the other below ground, there would be less hazard or danger to the tank underground from its catching fire from other buildings. If you cover a tank with three feet of earth you will have a vent which would let out the gases of high explosives which would possibly ignite. That would be equally true of a tank above ground. The fire hazard would be less in the underground tank.

The soil at the tank in Norton was a fine sand, I would say for about ten feet, and then the sand got coarse down there, probably four or five or ten feet further, and got into a gravel and that was a water bed. I would say that there [fol. 274] was between five and ten feet of coarse sand, and below that gravel mixed with water.

The soil at Herington is lime rock. The rock is at the bottom of this tank, about 7 feet under the surface. The tank rested on the rock with gumbo or heavy clay earth above it, about eight feet.

Redirect examination.

By Mr. Doran:

Fumes arising from an underground tank will catch fire. The chief virtue of above ground storage as against underground is ability to discover leaks. I think that the leaks are as a rule the cause of fires and explosions, if exposed to fire. If a tank is closed up and there are no leaks there wouldn't be any fire from the tank itself. A steel tank above ground wouldn't be as bad to catch fire as a wooden structure. The handling of gasoline and fuel oils in a steel tank above ground, where it can be policed and leaks discovered, is a reasonably safe way to handle gasoline and fuel oil.

Recross-examination.

By Mr. Bennett:

I think there is less danger from communicated fire when the tanks are underground. It (the petroleum product or

vapors) would take fire before an explosion. Possibly the danger of explosion would be minimized to that extent.

Redirect examination.

By Mr. Doran:

Before there could be an explosion in either case there would have to be gas. An underground tank could ignite the same as the above ground tank.

Recross-examination.

By Mr. Bennett:

Concrete tanks (about which I have testified) were covered. The one at Herington had a wooden covering. The one at Norton was covered with concrete. That is the reason I did not go down in the tank at Norton.

Here the following stipulation was entered into between the defendants and the Standard Oil Company:

"Mr. Colmery: It is agreed by and between the plaintiff, the Standard Oil Company, and each and all of the defendants, that the plaintiff, the Standard Oil Company, has occupied the premises in Marysville, Kansas, described in its petition, continuously for more than twenty years prior to [fol. 275] the commencement of this action and has during all of that time maintained thereon for the purpose of keeping and storing gasoline and kerosene, tanks similar to those there at the time of the commencement of this action; that the records of the City of Marysville do not show that the city ever granted the Standard Oil Company any permit to so locate or maintain said tanks and that no action such as that contemplated in Ordinance No. 350 was ever taken by the City of Marysville until about two years prior to the passage of said Ordinance No. 350 at which time ineffectual efforts were made to regulate by ordinance all keeping and storage of gasoline and kerosene in the City of Marysville.

"Mr. Evans: That is all right, we do that on account of the amendment at the commencement of the trial in which they withdrew their admission and changed it to a denial. We will want an opportunity to amend our reply."

FRED L. ARMSTRONG, a witness called by the defendants, testified as follows:

(Tr. of Testimony, 457-464)

Direct examination.

By Mr. Bennett:

My name is Fred L. Armstrong; residence, Greensburg, Kansas. (Error; should be Greenleaf, Kansas.) Occupation, jeweler. I am on the Council and we have a Business Men's Fire Department, and I happen to be chief of that.

I recall the instance of a fire at the Standard tanks at Greensburg (Greenleaf) a couple of years ago.

"Q. When was that as near as you can remember?

"Mr. Evans: The plaintiff objects for the reasons that have heretofore been given to the offer of testimony from this witness respecting the fire at Greensburg (Greenleaf) Kansas.

"The Master: Same ruling.

"Mr. Evans: Exception.

"Q. When was that?

"A. It was, as near as I can remember, about the 6th or 7th of September, a year ago last," 1923.

The tanks at Greensburg (Greenleaf) are a little north of town, outside the city limits, about one thousand feet from any house. Setting out in the middle of the wye. The Standard property consisted of two horizontal tanks and a [fol. 276] house, housing the pump. At the time of the fire this house was a frame building.

"Q. Do you know what sort of apparatus the tanks had on in the way of vents and manholes?

"A. No I do not, they have some kind of——

"Mr. Evans: I object, he says he don't know.

"The Master: Sustained."

There was a manhole on top, and also a pipe running up there of some description. I don't know exactly what, but it was along the top of the tank. I think both tanks were equipped that way.

The first notice I had of this fire, the fire bell rang and of course I started out there and saw a big volume of smoke out on the north side of town. I was down town, about half a mile away, when I first saw the smoke. When I got there there was a very spectacular blaze. The building was all in flames. We couldn't see the tanks; the building set against the tanks. The tanks were not burning at the manholes. They later caught fire there.

The wind was blowing from the north, a little west. It was a very destructive blaze and every once in a while the wind would whip it down toward the ground. You couldn't get in the line of the wind because it was so smoky and hot. The heat was not noticeable where we were, about 500 feet away I think. We could just feel it. The wind was blowing away from me at that time.

The gasoline was flowing toward the Crew-Levick tanks but it stopped before it got to their buildings; they were Southwest of the Standard, but more west than the line of the wind, more west that south. The wind was blowing the fire away from the Crew-Levick tanks. The ground sloped toward the Crew-Levick. The gasoline ran downhill towards the Crew-Levick. It burned the grass for about 80 or 100 feet beyond the tanks. The flames would shoot into the air about 100 feet, I would say.

There were minor explosions; one in particular, a barrel blew up containing some combustible or other. There were several minor explosions, a great big puff of flame with it. That was out of the tanks twice, out of the building several times. One of the manholes on the tank flew off, or was taken off before the fire. I noticed it was off and it was burning through the manhole.

[fols. 277 & 278] Cross-examination.

By Mr. Evans:

It was burning through the manhole. The manhole was off to one side, and I saw the manhole cover lying off to one side, looked like it caught on the edge and was laying over to one side. There was a flame there. Mr. Wells climbed up on the tank the next morning and put out the fire. The fire commenced about four o'clock in the afternoon and

burned all night. They put it out some time next morning. I wasn't there but I understand that he went up, I don't know what time it was and I don't know the state of the fire at that time.

The very same tanks are still in use out there.

There was some fluid flowing down towards the Crew-Levick, it was oil or gasoline.

Plaintiffs' Exhibit P fairly represents the location of the tanks and surroundings at Greensburg (Greenleaf). That is just the way it was.

"Mr. Evans: The plaintiff offers that in evidence as a part of the witness' cross-examination."

The Clerk will here insert copy of Plaintiffs' Exhibit P. A drawing found in the Book of Exhibits.

(Here follows Exhibit P, marked side folio pages 279 and 280)

[fols. 281 & 282] Mr. Evans here had witness look at Plaintiffs' Exhibits I, J, K, L, M and N. He answered:

"A. These pictures were evidently taken the next morning. I was out there about eleven thirty at night and the fire was still in a spectacular condition but here it looks as though it had died down so I would judge they were taken the next day.

"Mr. Evans: The plaintiffs offer these in evidence as a part of this witness' examination."

The Clerk will here insert copies of Plaintiffs' Exhibits I, J, K, L, M and N.

(Here follow said exhibits, marked side folio pages 283, 284, 285, and 286)

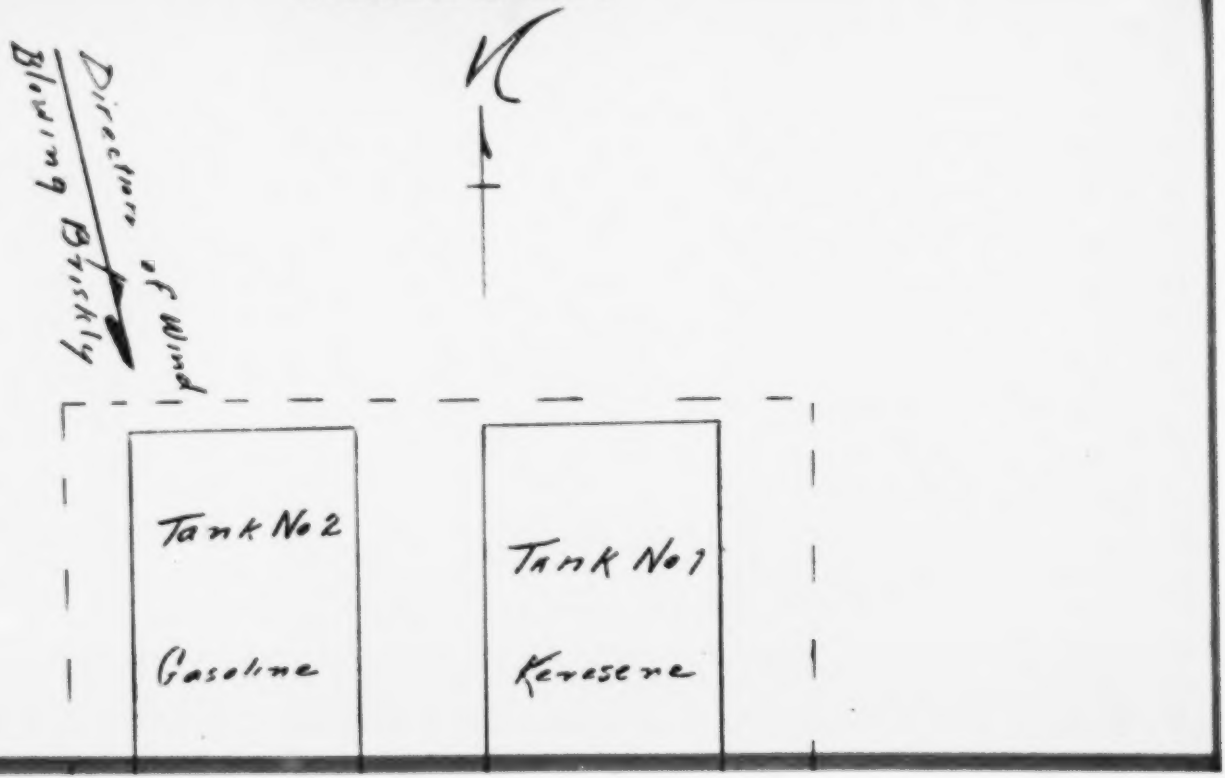
[fol. 287] I didn't see the top of the manhole fly off, but saw it lying off to one side. Saw the flame at the manhole after the cover was off.

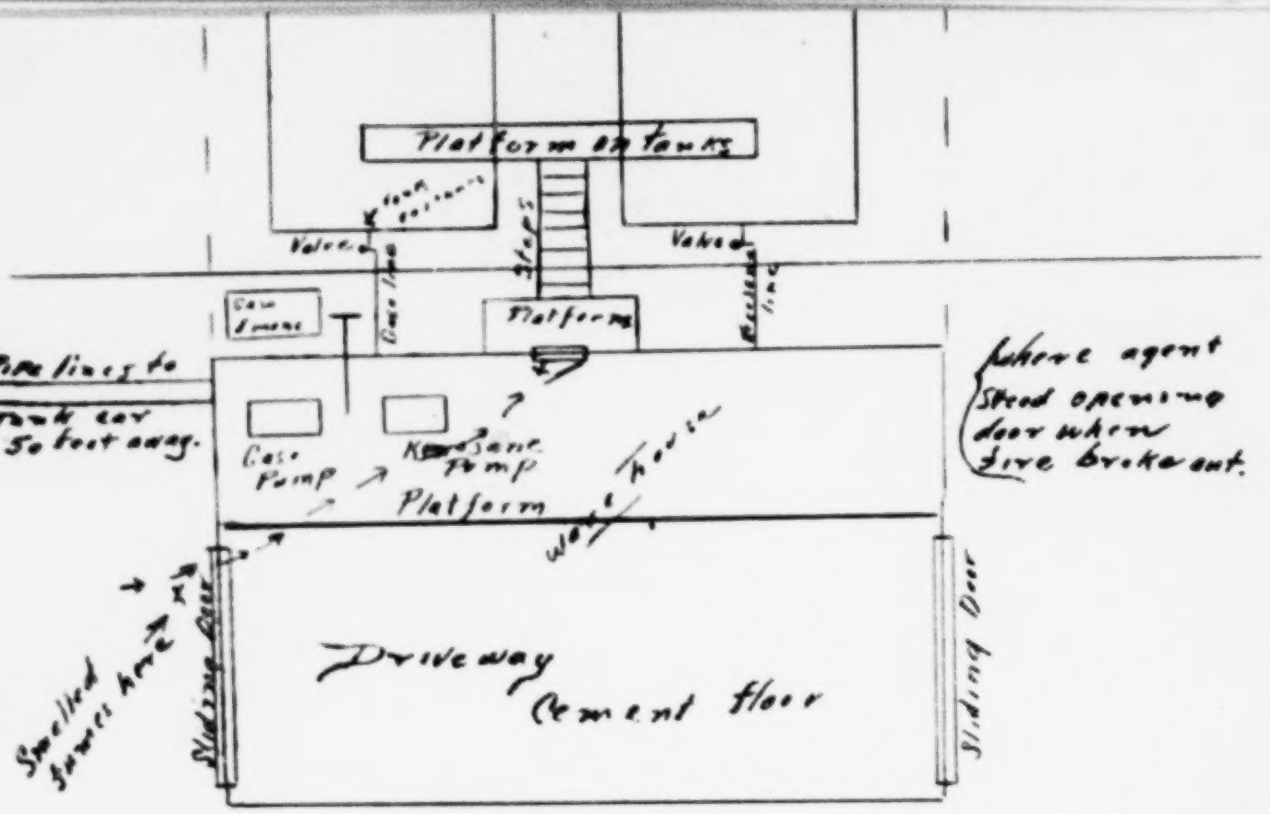
Redirect examination.

By Mr. Bennett:

There was some burning oil running down the hill. It was coming from the building. It was a flow of flame from

PLAINTIFFS EXHIBIT P

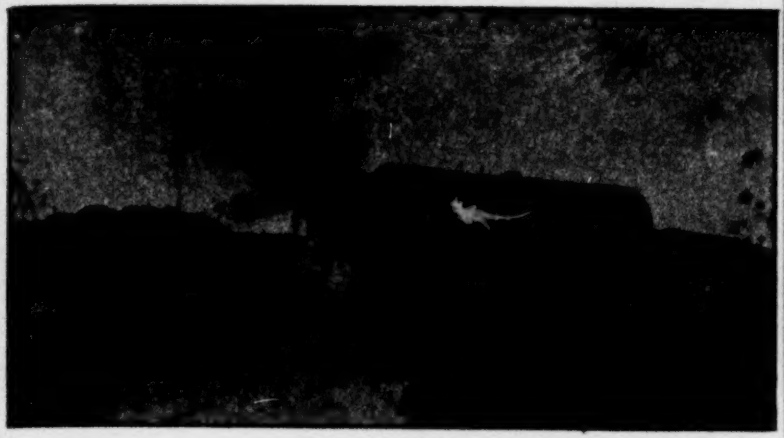




279-280

Fire at Greenleaf Kansas
Sept 6- 1923.
A.L. Steinhauser

PLAINTIFFS EXHIBIT I 283-284



PLAINTIFFS EXHIBIT J

PLAINTIFFS EXHIBIT K

PLAINTIFFS EXHIBIT L 285-286

PLAINTIFFS EXHIBIT M

PLAINTIFFS EXHIBIT N

the tanks or the inside of the building. Just a flowing flame all the way along. It ran about seventy feet anyway.

Cross-examination.

By Mr. Doran:

The warehouse was all in flames. The flame came from that way. The flowing flame didn't continue a great while. It flowed down and burned itself out.

EARL D. TARVIN, a witness called by the defendants, testified as follows:

(Tr. of Testimony, 464-473)

Direct examination.

By Mr. Bennett:

My name is Earl D. Tarvin; residence, Marysville, Kansas. I work for the Marysville Water and Electric Company, am general foreman of construction. Have been employed by the Marysville Water and Electric Company about 15 years. Have been foreman all that time. Have lived in Marysville all my life, 35 years. Have charge of the maintenance of pipe lines of the Marysville Water and Electric Company.

We have galvanized cast iron pipes in the ground, about ten miles of it. The soil in Marysville is mostly gumbo and clay. I am familiar with the soil in blocks 40 and 71. There is some black soil and it runs into gumbo, about 18 or 20 inches. It is the same practically all over town. The waterworks was established in Marysville in 1889 and these mains were most of them put in at that time.

Over the objection and exception of the plaintiffs (the ground for the objection being that the oil companies do not use cast iron pipes) the witness testified:

"We have no trouble at all with corrosion of cast iron pipes." We have very little trouble with galvanized iron pipes. From 1889 would be approximately 35 years.

Since we have started paving we have had more trouble, as they moved them when they took them up it was hard to get them back together. We have ground detectors which show currents of electricity flowing in the ground. I can't [fol. 288] tell what quantity of current loss would be detected with that instrument. If a line is in trees or falls to the ground, the instrument shows it right away. We try not to have any current loss up at Marysville, aside from the times mentioned, except in storms or something like that, when the lines break.

Witness is handed defendants' Exhibit 9, a piece of oil line pipe, "where we unloaded fuel out of the ground in the same manner as the Standard Oil Company." We have a fuel oil tank and we unload from a car at this end and carry it down the street to our plant. This is the end of the line that comes out of the ground where we unload. The ground where this piece of pipe was taken up is all cinders, there is leakage of oil, we have a covering of sand. This piece of pipe was buried in cinders since 1913. The same condition as when taken out of the ground, except that it has been wiped off.

This exhibit was offered in evidence; impossible to insert in the record.

Witness was here shown defendants' exhibit 10 (a piece of cast iron water pipe) that came from 15th and Broadway, where the water line was changed last week.

It has been in the ground since 1889. It is in the condition in which it came out of the ground. It was broken when we graded the road.

Defendants' Exhibit 10 was offered in evidence; also impossible to insert in the record.

We try to keep the (electric) lines off the ground; where there is a line there is loss, it is well known that this is true. I have been told that if electricity goes into the ground and into the pipes it eats them up; I have had no experience with it. I haven't seen any pipes affected with that. I have dug up other pipes besides these. We have no iron pipes. There is an electric line next to the tanks or to the building—the present location of the Standard Oil and Sinclair Oil storage tanks in Marysville—it connects right with it. We have a round house and cold storage plant

operated by electricity in Marysville also laundries using electric current for power. Their machinery is attached to the building, and it sits on the ground. I suppose there is a line loss of electricity wherever there is a line. This is recognized by all electric companies.

Redirect examination.

By Mr. Bennett:

We have alternate current in Marysville; there is no direct current except for charging batteries. I never saw a [fol. 289] sample of pipe with which we had trouble on account of electrolysis. I have been told that black iron pipe is less resistant to electrolysis than galvanized iron pipe. This pipe (referring to one of the exhibits) was buried in cinders and clay and covered with sand that was wet. That condition would be unfavorable for the burying of iron pipes.

The tanks of the Standard are between Elm and Walnut streets. The round house is clear out at the north end of town almost a mile from the Standard tanks. It is a little farther to the Sinclair tanks. The laundry is four blocks north of Broadway, six blocks from the Standard and the Sinclair tanks are three blocks further, south.

Recross-examination.

By Mr. Doran:

Marysville buys electric current, its generating station is at Blue Rapids. There are heavily charged transmission lines that run into the City of Marysville. The distribution point is at our plant, Fourth and Walnut three blocks from the Standard tanks, and from that distribution point the power lines and electric light lines run all over the city.

At this point, permission was granted plaintiffs to re-open the cause in chief. Thereupon Mr. Boehmer was recalled by plaintiffs and testified as follows:

(Tr. of Testimony, 473-497)

Direct examination.

By Mr. Evans:

I am familiar with the McDonald Duplex vent, and also with the manhole vent about which Mr. Wagner testified, and with the storage tanks of the Standard Oil Company at Marysville about which Mr. Wagner testified.

I don't see how you could have backfired into a tank equipped with a McDonald Duplex vent and manhole vent of the kind described from an external fire. The McDonald vent has a metallic screen which is the same safety device used on a miner's safety lamp. Fire would not go through that. The safety manhole cover is of such weight that you have to have considerable pressure to raise it, a pressure of several ounces, and by the time you obtained that pressure it would be past an explosive mixture. The manhole vent will not function until the McDonald vent is [fol. 290] overloaded. As soon as the pressure drops the cover would fall back into place.

Here the witness made demonstration before the Master of gasoline in a glass tube and testified:

The point I am interested in will be around the top. The fire will be at the top. The gasoline vapor within the tube is so dense that combustion will be right around the edge here.

"Mr. Colmery: It makes a difference if you apply heat. That is the theory of the manhole that it will burn only at the outside?

"A. Yes."

If you fill it and apply heat it will probably boil over, but I doubt if there would be any left unburned, but when you take a tank of larger diameter and apply heat, it wouldn't boil over in the 'stills; I never saw one boil over. Of course that is an aggravated condition of a storage tank

and of course that is a still with a varying amount of gasoline. A tank with these safety manhole covers has enough venting capacity to relieve any pressure that we could conceive to be generated from the outside and you couldn't have a backfire to get combustion within the tank, so the possibilities of explosion are nil.

Vapors arising from gasoline are heavier than air. I don't know whether this gasoline (in the test tube) will vaporize rapidly enough to show. We have had several accidents due to vapor creeping along the ground. I recall one fire, I don't know the exact date, we were unloading some gasoline which we were purchasing and the dome covers of three of the tank cars were removed because we were pumping on the cars. The vapors from these cars crept over the sides of these cars and crept into a building about one hundred fifty or one hundred sixty feet away and ignited and a sheet of flame traveled back to the cars and ignited the domes. We had them out in about thirty minutes by chilling the cars with water to keep down vaporization. They burned at the dome and manholes.

Shooting holes in a tank that was burning at the top would increase the hazard because you will spread the gasoline all over the neighborhood and the ground surrounding the tank, and if that should become ignited due to radiant heat you would feed the fire more than ever.

It is an unusual thing around refineries to have these tanks that contain these products spring a leak and have [fol. 291] flames on the outside. All of our storage tanks will show sweating or small seam leaks occasionally, there are only two or three instances where they were ignited by lightning and in one case by a static spark produced by a sample boy. In 'stills we have some leaks especially when the stills are newly constructed. They are ignited from the fire box. This is not a dangerous element. The stills are horizontal cylindrical affairs with riveted seams and even after the most careful boiler maker work the seams will leak a little at first. They will take fire every time we want them to take fire because it seals the seams. If the leak is too bad we try to caulk it a little more but a little flame shooting out, say ten inches, we wear them out. That is not unusual around refineries where they have stills.

Cross-examination.

By Mr. Bennett:

It would not be a good thing to set fire to the storage tanks at Marysville now and then to help the seams. There is no use in burning up the product. A welded seam is not reliable for 'still purposes. In storage tanks we use riveted joints altogether for the same reason that it has a reliable factor of safety that a welded joint doesn't have. In constructing riveted joints the two sheets of steel are laid over one another, holes punched and rivets driven through hot, and when they contract they pull the sheets together. In a welded joint they sometimes just put the two plates together and weld on both sides. Stills made by a competent welder are not always reliable. We discarded twenty stills. The stills worked with a pressure upwards of eighty pounds. I have not calculated the working pressure of the storage tanks at Marysville but it would not be more than 40 or 50 pounds. That would be the bursting pressure. The pressure under which they are used is not over one pound. The stills which we used for eighty pounds were constructed for operating at higher pressure, the weld was heavier. A still constructed for 80 pounds pressure and operated at one pound would be safe. The manhole safety covers would relieve anything below one pound internal pressure.

In riveting seams I wouldn't say it is impossible in lapping two sheets of metal to get them exactly together. They have to be caulked or sealed with welding. Every riveted seam is either caulked or welded. After the seams are riveted a tool is used which will drive the metal down into the edge. The razor edge is the seal. If riveted too tightly possibly it would break. Rivet failure is caught when a tank is tested. I don't know of any storage tank where we [fol. 292] have had a rivet break after cooling. The distance of the rivets apart depends upon the type of rivet used and the pressure you are riveting against. I don't know what they use on light tanks. In a welded joint it is necessary that the whole joint be welded. In riveting if it is not drawn up together it will show on a water test. On these 55000 barrel tanks they get (use) the half inch and $\frac{5}{8}$ inch steel rivets. My recollection is that the bottom of such a tank would not be less than one-half inch steel. I mean the

bottom ring, and it would taper up into not less than one-quarter inch steel on the top. Rivets are driven in hot. We do sometimes use rivets that are not hot when hot rivets would be a hazard; we might be working adjacent to a running still. That would be the only time the rivets would not be put in hot.

A flame would not creep back of a screen in a McDonald vent. That screen would work in an underground tank. It is impossible to backfire down that vent.

Shooting holes in tanks spreads oil over the ground; it might be ignited from radiant heat from the top of burning tanks. I doubt if internal pressure would be relieved very much by a few small holes.

Vents which are not the right kind of vents can be overloaded. If you shoot holes they will feed the fire. If there are enough holes the fire may spread. If the vents become overloaded you would probably rupture the tank. It would probably rupture some place. That would depend on the internal pressure. I have heard that they keep small cannon in the fields, but we have none at the refinery. They have used those in crude oil fires. They try to take a gamble on saving some of the oil. In crude oil fires it is worth running the chance because crude oil tanks are always isolated, but it is not to relieve pressure because the roofs of the big storage tanks are very weak anyway. Crude oil is a little greater hazard on account of the fact that it foams. The fundamental principle in shooting crude oil tanks is to try to keep it from foaming.

I testified that I considered above ground storage safe. If you have a tank above ground it will vaporize more rapidly than a buried tank and give a larger fire, but the tank underground might have oil soaked earth around it and communicate fire to adjacent property. If the ground was soaked with oil, the vapor from the oil in the ground would burn, it would vaporize from the surface of the ground. There might be a very small space between the [fol. 293] surface of the ground and the flame, the flames would be close to the ground. The possibility of the gasoline in the tank underground vaporizing would be lower. There would possibly be less chance of the vents being overloaded in an underground tank. Vents should be so constructed as to take care of all overloading pressure by making them

larger. The vents we have are large enough to take care of that with a good hot fire under it.

If a tank were full and an intense heat applied to the bottom, such as a warehouse falling over, some of the liquid might run out. It would probably ignite. It might help to heat the tank by the expansion of liquid gasoline, the expansion would not be very great and the stuff will burn up rapidly. Gasoline does not extend nearly so rapidly in liquid state as in vapors. We are prohibited from filling the dome of tank cars on account of thermo expansion, it will expand but not much. The co-efficient expansion of gasoline, as I recall, is about one per cent for every 20 degrees F. I am not absolutely sure of that figure.

Ground soaked with gasoline would be hazardous. I don't see why that condition should exist at above ground stations such as we maintain. If tanks above ground are maintained with proper supervision, leaks are found as soon as they start and they are stopped, whereas underground tanks will keep on leaking and soaking the earth. I testified the other day that gasoline would seep through the ground and get into sewers.

"Q. What would you say that the amount of gasoline would be which would be necessary to introduce into an eight foot sewer running half full of water at a given point to produce an explosion?

"A. All you would have to have would be enough gasoline vapor to be equal to about six or seven per cent of the air and that would create a good explosive mixture."

The reports of the Bureau of Mines are sometimes regarded as good authority, and sometimes they are not. They are not always accepted as authority on subjects they treat, not even in a general way. Many subjects discussed are subjects about which various industrial concerns have a great deal of data which the Bureau does not have. There are many subjects on which bulletins are written where their findings are contradicted by other information.

G. A. Burrell is a man who has had a good deal of experience with gases. Whether I would consider his report [fol. 294] on any experiment reliable would depend on the subject and what other authorities have to say on the subject.

If a fifty-five gallon barrel of gasoline at one time were introduced into a sewer eight feet three inches by eight feet six inches high, twenty-seven hundred six feet long from the manhole to the outlet in the river, and tests at the different manholes along the sewer showed that the highest percentage of gasoline vapors two feet above the sewer water was seven-hundredths of one per cent and the highest percentage, two inches above the sewer was one and twenty-seven hundredths per cent, the seven hundredths of one per cent would not be an explosive mixture; the one about two per cent would not be violently explosive. The refinery gasoline with a gravity of 67.5 degrees was a fairly volatile product, a little higher gravity than the ordinary gravity; the average velocity of flow in the sewer described being 6.45 lineal feet per second. The study of factors like this, there being so many factors to watch, it is almost impossible to get reliable results.

The last test I made (before the Master), if you would put cold water at the bottom of the tube, the flame would gradually creep down at a very low rate, but never assume an explosive condition, and it couldn't if we laid the screen over it. If a tight cork were placed in the test tube with a hole in it, bearing the same relation to the contents as the manhole does to the size of a 10,000 gallon oil tank, I think it would relieve this satisfactorily. The gasoline I am using is high test; it is not satisfactory motor fuel. It is 87 gravity. I took it so I might create a lot of vapor. The high test gravity has a low boiling point and the stuff used in a motor will boil less rapidly. When I applied heat to the bottom of the tube the gasoline on account of its extremely low boiling point lifted itself out of the tube. This is a tube with a very small cross section; in a tank it would take longer to penetrate. With the proportions the same it wouldn't happen so quickly, the upper part of the tank would remain cool. I doubt if it would boil over unless the tank was full. The tanks are frequently full.

My fundamental idea in this demonstration, in bringing gasoline that was of high volatility, was to demonstrate that the vapor was heavier than air, and I could hold a tube in my hand, we could see the vapors creep down the side of the tube. Ordinary gasoline vaporizes less rapidly and therefore you would not have had such a rich mixture. It still

[fol. 295] vaporizes rapidly enough to maintain the richness in the tube. That richness would decrease with ordinary gasoline but not to the explosive limits. There is more danger of creating an explosive mixture with a low volatility gasoline than a high. Because it has a lower volatility, there is less mixed with the air. Any gasoline used as a motor fuel would vaporize rapidly enough. You would be more apt to get an explosive mixture with a low test than a high test gasoline, if you consider your volatility. There is less gasoline vapor in the winter time than summer, and in the space above the liquid in the vent. There is a little greater danger in the winter time, but in either case it is above the explosive limits.

To my knowledge we never had at our refineries a gasoline tank explode. I heard the testimony about Hays. I think that was due to pressure failure. From my understanding of the subject, the sales department (storage tanks) are all equipped with the safety manhole covers and I believe the chances of another pressure failure are nil. Pressure is caused by fire around the tank. I have illustrated that by applying the match to the test tube. I surmise that at Hays "the vents were overcrowded and didn't take care of the vapors." I understand that the tanks at Marysville are equipped with adequate vents. I would say that they would not explode with these vents. I think I could go in and light a cigarette. The tanks might boil over if full but that stuff would burn up quite rapidly. It would boil over and run down the sides. There is a limit to how long it would boil over.

It is my guess that if lightning struck the vent pipe on an underground tank that it might rip something up. My opinion is based on the fact of lightning striking trees and buildings, they are connected to the ground. As to the likelihood of lightning striking a tank above ground with a larger exposure, and striking the vent pipe on the underground tank, I don't believe it would make much difference where the tank was. The possibilities of a direct hit would be the same, I think. It is purely guess work. Direct current is necessary to produce electrolysis. If you have a city where there is no direct current there probably wouldn't be any electrolysis. Leakage from electrolysis would be removed if there is no direct current. You would still have corrosion.

Redirect examination.

By Mr. Evans:

Gasoline would work upward through the ground; I couldn't say as to vapor, I never studied that.

[fol. 296] "Q. Would it work in other directions?
"A. All directions."

A leak under the ground the gas might work toward the surface and their vapors, and in leaks above ground the air would tend to dissipate those vapors.

Recross-examination.

By Mr. Bennett:

"Q. I suppose that is a capillary attraction?
"A. Yes."

Hamilton Perkins Cady, called as a witness for the defendants, testified in substance as follows:

(Trans. of Ev., Vol. 2, pp. 497-553)

I am chairman and head of the Department of Chemistry at the University of Kansas and reside at Lawrence. I took my Bachelor's Degree at the Kansas University, attended Cornell for two years, finally took my Doctor's Degree at Kansas University. I have been there as a teacher since 1893. The branches that are taught there are Inorganic Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Chemistry and Physical Chemistry, Metallurgy, and quite a bunch of courses in Quanitative Analysis. Those that I have personally taught are Inorganic Chemistry, Qualitative Analysis, Quantitative Analysis, Organic Chemistry, Physical Chemistry and Metallurgy. I also teach electrical chemistry. In connection with Professor Bailey, who has been with us for over forty years, I have written text on Quantitative Analysis and by myself Inorganic Chemistry and General Chemistry. This is an abridgement of the first two. I have also carried on researches in various lines and am the man who discovered

helium in natural gas. This is the gas now used in very large, heavier than air, ships. Years ago before I took my first degree in connection with Professor Bailey, we analyzed a lot of the oils of Kansas as then discovered and the gases known at that time. I am not sure but I think that those were the first analyses made on Kansas oils. I have had experience with electrolysis and have done research work along that line. Of course we have our laboratory instructions on it and then I was associated with an industrial concern in the city of St. Joseph some years ago when they were having trouble with natural gas explosions. I have been with a few concerns as consulting chemist in the industrial field and also connected with the Bureau of Mines. My title was that of Consulting Chemical Engineer. [fol. 297] That was in connection with the helium investigations. We did the investigation of Kansas University and worked out various problems so far as could be worked out in the laboratory before they constructed the plants. I have also acted in a consulting capacity for the Utah Oil & Refining Company, this last year and for others, but I cannot think of them—for a concern interested in the development of the Dexter fields and also some people here in Kansas. To get any appreciable amount of electrolysis you have to have a direct current of pretty fair magnitude flowing there and from the iron structure. The electrolysis takes place when the current leaves. Under certain conditions you can get a limited amount of electrolysis from an alternating current. We use the alternating current in measuring the passage of an electrolyte because it does not cause electrolysis. I have recently conducted tests in the city of Marysville to determine whether or not electrolysis was present. We drove up to Marysville last Sunday with apparatus for detecting the presence in the ground of currents of electricity either direct or alternating. I took along for that purpose first a number of battery cells such as used in certain types of batteries, and to permit water to seep through, a supply of copper sulphate and copper electrodes. The reason for selecting those, you could get with the aid of copper sulphate and the electrodes would be unpolarizable—that means that you could pass a current in and out without making any appreciable change in the condition of things—and then two or three hundred feet of wire for connecting these things up and a delicate little am-

meter for detecting the current that might be flowing, and also a set of receivers such as are used on radio sets which are very sensitive to the passage of electric current. The ammeter would detect very small quantities of direct current but would not be sensitive to alternating current and the telephones would detect alternating and also could be used in direct current because every time you would break the circuit you would hear a click. If it was alternating current you would get it also. So we were equipped to detect very small quantities of alternating current and also to measure them because in addition I had an alternating current ammeter. We went first in the neighborhood of the Sinclair tanks just outside of the fence surrounding the property and drilled down into the ground for a number of feet. Finally going down nineteen feet and eight or nine inches, and incidentally we took samples of soil. That did [fol. 298] not have any bearing on this, however. And after finishing that we put one of the cells down in the hole and we took the other across the spur in the neighborhood of approximately seventy feet away to the east a little south of east, put that down there and established a current. We tried the head pieces and there was no sound. There was no alternating current and apparently no direct current, and then I put on this little ammeter with which you could tell the ten thousandth part of an ampere. No appreciable current, either alternating or direct, was flowing in that direction, and then we went to the hole at right angles to this about one hundred fet away and tried it again. With the ammeter there was no certain movement, but on connecting up the head pieces you could hear a feeble click in the telephone. There was no alternating current but an exceedingly feeble direct current flowing in a north and south direction. I checked up to see if there were really contacts around by putting in a little battery of this small flashlight battery, three cells of those and the ammeter would give a heavy throw and got a volt reading to enable me to after I got back to figure the total resistance, and it was in the neighborhood of fifty ohms, including all the connections and most of that in the cells. This current was flowing in a north and south direction and was too small to be measurable or to be given any serious consideration. Then we went on up to the Standard place and by per-

mission went inside the rail, at least I think by permission, and selected a place near the tanks and again workmen drilled down and after completing the hole, which was to a depth of nineteen and one-half feet, we went through the same series of tests from the hole again somewhere in the neighborhood of seventy or one hundred feet and got nothing in the east or west direction, and then going north approximately parallel to the line we had before we again got the same very, very feeble indication. I do not know what was the cause of that but I surmise—in thinking about it I remember that when we got this indication we were working parallel with the Blue Valley railroad track and I surmise that we were detecting a return current from the telegraph batteries. It was approximately the length of this desk (indicating) from the Sinclair tanks to the first hole, probably not quite as far as twelve feet. It was closer to the westward at the Standard tank. Things are not north and south there to me. It was approximately as far as from here to the stenographer, five or six feet. If the conditions which produce electrolysis had been pres-[fol. 299] ent there I would have been able very easily to detect it. There were at the time of my examination no conditions there present at Marysville which I would say produce electrolysis and corrosion. Wet soil is a good conductor and dry soil is not. Unless there were some direct currents, there would probably be no electrolysis, because we certainly had no alternating current existing. My attention was called to a pipe there which was approximately in a direct line with the two holes that were made up at the Standard for this electrolysis test just across the track from where the north hole went down. I said the ammeter would very easily read to a ten thousandth part of an ampere and you could detect less than that and the telephones were more sensitive. I have a pocket lens to read the instruments down to a fine point and when I detected a sound in the telephones, I used the pocket lens and I still could not see a movement in the ammeter. There is a little hand on the ammeter that moves when you get a current. The ammeter goes clear around the scale for fifteen one-thousandths of an ampere. One mill ampere is one one-thousandth of an ampere. I do not believe that the presence of the current that is found there to have been in-

duced by the fact that our wires crossed the railroad track for the reason that you can induce a current in a circuit only when you have a magnetic field in the circuit varying in strength, and there was nothing to indicate that anything of that kind was there. I have worked with galvometers so sensitive that if you moved the line away the galvometer would move. We took two samples of soil from the Sinclair tanks. We had an auger about two inches wide, I should judge, that was fastened to the end of a piece of pipe apparently about twenty feet long, and that was started with a hole by a shovel and this was started down into the ground by the workmen. They would drill down a ways and take the dirt out. Occasionally we would put some water down to facilitate the digging. The soil was a hard clay. After we got down about three feet they worked until the soil was dry. I guess they did not put water in for three feet. We took a sample at three feet and then in the neighborhood of ten feet, using water freely, and then slacked up until the ground was only moist, and then took another sample of that. And then I took the sample to the laboratory and examined it. They continued the drilling to ten feet, eight inches, but took no more samples for the reason that there were no changes in the material. This was a clay soil. I guess gumbo would describe it. It was towards the top a little inclined to a blackish tint and distinctly yellowish in the neighborhood [fol. 300] of ten feet and on down. There was no sharp line or division between the yellow and black. It just shaded off. The soil as far as I could tell by the digging was the same at nineteen feet, eight inches as it was at ten feet, six inches, where we took the sample. I made tests there for acids with litmus paper. We used red and blue and neutral litmus. Litmus is quite sensitive to either the presence of acids or alkalines and the soil reacted virtually neutral. It was perhaps a shade of tendency toward acidity but not enough to bother anything. It took between two and three hours to drill that twenty foot hole. The hole up at the Standard Oil property was drilled in the same manner and I kept testing samples of the soil as I went along. The top of the soil had some cinders and under that some soil like made soil, and then we struck the gumbo, a

soil a little darker in color. That was at about a depth of two and one-half feet down, as I recall it. The top part was virtually neutral to the litmus paper but when we got down to the native soil, it gave more distinct indications of acid but it was a feeble test at that, and we took a sample between four feet and four feet, nine inches. It took about that much to fill the bottle and the soil was almost, if not quite, neutral—and then we went to eleven feet, six inches, and took the sample and the soil now was a grayish yellow. That hole was run to nineteen feet, six inches with no change of the soil. The soil at the Sinclair was more yellow than the Standard although it was much like it. We went through the top layer of black earth to the yellow. It shaded off the same as it had down there and was apparently the same formation. We picked out the soil, picking it from the bit of the auger just as it came out of the hole and put it into a glass stopper bottle and of course labeled these bottles and took them back to the laboratory. Now the first test that I made on that was designed to see something about how permeable the soil was to water and I took a porcelain funnel that was about so big around (indicating); it would be a twelve centimeter funnel, two and one-half centimeter to the inch. Well, let's see, I would like to modify that because while it was handed to me for a twelve centimeter funnel yet I don't think now that it was more than ten. Then I put on top of the porcelain—right where the cone goes on to the cylinder there is a porcelain plate and it has a number of fine holes in it. I put it on top of the paste which I made with this soil about half an inch in thickness. It run from seven-sixteenths to one-half inch thick, and I packed this in as tightly as I could and wet it only enough so that I could resemble as nearly as possible the condition in which it was in the ground. Then I [fol. 301] put the end of this funnel into a heavy walled glass flask, a bursom filter flask so I could produce a vacuum and slipped inside of this filter flask a test tube to fit over the end of the funnel and catch any water that came out. Then I connected this up with a water pump which would work pretty well. It pumps down to the neighborhood of the vapor pressure of water and that would produce a pressure approaching fourteen pounds to the square inch, driving the water down through the soil into the test tube.

We put on top of the clay twenty-five centimeters of sand and kept the pump going for two and one-half hours and then stopped the experiment, and at the bottom of the test tube there were just a few little droplets of water. Of course there would be a chance in the vacuum for water to evaporate but that was taken care of and by having some water in the flask and outside of the test tube so that it appeared that this soil was quite impervious to the easy movement of water even with the difference in pressure. Then I took the same sample of water and got back twenty-three out of twenty-five cubic centimeters of water. The rest had soaked in and I put twenty-five centimeters of gasoline in the same condition. I put some gasoline in the bottom of our flask. I think it was Red Crown gasoline that I put in. I got it from the keeper on the ground. Then I pumped this for two and one-half hours and got a drop of liquid a little larger than the water and that liquid would not burn and froze in ice and salt which showed it was not gasoline and was water. I tested sample No. 2 in that manner but did not test the other. I made similar tests on sample No. 2 from the Standard and in that case I got a large quantity of water from the clay, probably in the neighborhood of a cubic centimeter of water, but I poured back more nearly the same twenty-five cubic centimeters of water after the test and the water that came through was quite clear. The Standard soil was much more moist. Then we tried the same test with the gasoline and again I got some liquid appearing in the two and one-half hours and this liquid was really larger in quantity than the other tests but it also would not burn and it froze at the freezing point of water, so that it was water. Water freezes at 32 degrees Fahrenheit but I cannot tell you the exact freezing point of gasoline. Some will not freeze at 312 degrees below, that is the more volatile parts of it. So I know that this was not gasoline. It had practically no odor. I safeguarded those gasoline tests for evaporation by putting gasoline outside of the test tube so no evaporation could take place in it. I also made an attempt to determine [fol. 302] in as close a manner as I could considering the nature of the stuff the amount of free acid in it. These clays are about as mean a kind of thing a fellow can work with because it mixes with water with great reluctance and

in the next place after it is once mixed you can wait until the next election until it settled out, but I took a ten gram portion of each mixed as well as I could with water, put in some phenolphthalene, that is a dry like substance which has the interesting property of being perfectly colorless when in acid solution and a bright red in alkaline solution. It is very sensitive, so by using the phenolphthalene it would show up practically all of the acids in the soils and the vegetable acids as well as all other acids that might have accumulated. Well, we used that and the ten gram portion and a tenth normal solution of sodium hydroxide and ran that into the specimens of the soil in water a drop or two drops at a time and let it settle a little and did everything I could to get a clear part of it and when I put in enough to balance the acid it would turn the phenolphthalene red and so we determined in an approximate manner the amount necessary to get the maximum quantity that was there in these various samples. The first one that I worked upon was from the Standard Oil's soil No. 2, the one from ten to eleven feet, six inches down, and that ten gramm sample consumed enough sodium hydroxide so that if we had calculated all the acids as sulphuric acid it would correspond to about .049 of one per cent. We will call it five one-hundredths of a percent in round figures. I got a pretty fair check on Standard Oil sample No. 1 from higher up in the ground about four feet four inches down, as I recall it. It was a little more acid and the maximum would correspond to seven one-hundredths of a per cent if it was all sulphuric acid. Now down at the Sinclair, Sinclair No. 2 soil was distinctly less acid and would require only about half as much of the sodium hydroxide solution indicating about .025 per cent. I think I did not test No. 1; I do not recall and I do not see it here. I do not mean to say it was all sulphuric acid. It would be a pretty hard thing to say just what the nature of the acid would be, but at the same time I do think it was sulphuric acid because I took some other samples of the soil and worked them up with water and then clarified the soils for these tests by using a small quantity of aluminum nitrate. In the clarified liquid I tested for sulphates. Now if sulphuric acid, which I obtained from centrifuging were there, we would get sulphides, and I got very, very feeble tests for it so that I

think there was not enough sulphide to correspond to the [fol. 303] acid that I found. The acid reaction I found might have been vegetable. One reason that I searched for sulphuric acid was the presence of cinders on top of the soil which would furnish a possible source for sulphuric acid. Another is that because sulphuric acid is corrosive of iron in the ground. Down at the Sinclair place I got only feeble tests for the sulphate. I have an opinion as the result of my experiments as to whether or not the soil conditions surrounding the property of the Standard Oil Company at Marysville would produce corrosion and subsequent leaks in a steel or iron tank buried without soil three feet under ground.

Then over the objection of the plaintiff that the question is indefinite and does not take into consideration all of the evidence necessary as to the time when corrosion might start—the kind of tank or other things upon which such an opinion should be based, the witness stated that in his opinion the tank would not be corroded rapidly—it would take a term of years for the corrosion to start.

I would see no reason why the tank should be attacked any more rapidly than this pipe. I should say less rapidly. Unquestionably it would be protected by painting. I heard where the pipe was, and that it was under a more severe condition than the tanks would be. The most severe condition under which iron could be buried is in soil adapted to produce considerable quantities of acid and at the same time to allow pretty fairly free access of air and moisture. The air and water are factors of corrosion along with the acids. Many soils are naturally acid. Some are kept acid under conditions of cultivation but the circumstances surrounding this pipe was the sulphur compound, iron sulphate in the cinders. A loose soil would make possible that free access of air and penetration of water. The clay I found in there would make a pretty good seal against the air. Water moving downward would of course carry the things picked up above. That red clay did not look like it was the kind of soil that would let water down very rapidly. The condition would be much less favorable than in sandy soil; I will say that for sure. The corrosion of iron seems to take place in two stages, first the attack of the iron by the hydrogen irons from the acids, or even under favorable

conditions from water itself forming irons and free hydrogen gas, and the next thing is the oxygen of the air and oxydizes the irons, and if there is enough acid that may remain in the solution, but if not it would be precipitated at first as iron rust. The acids that would attack the iron [fol. 304] would of course be the acids in the soil that was against the tank. As soon as it attacked the iron it would be through and for the renewal of the attack by acids you would have to have some more acids coming in, fusing in through this soil and the fusion process is a pretty slow one. There is more of a chance at the Standard than the Sinclair and even at the Standard I think there would be no difficulty in protecting the tanks from corrosion from soil acids. I know of coatings that are used to protect against corrosion which would protect them in a large measure. I do not know of anything that would absolutely protect them. Any opinion I have as to how long a one-fourth inch steel tank buried two or three feet under ground of the soil found up there should last would be formed pretty largely from this pipe.

Q. Based on that basis?

Mr. Doran: We object as a matter of comparison.
The Master: Sustained.

A. The conditions would be worse at the Standard than at the Sinclair, because there is a larger acid content in the ground there. I think the danger is not great from corrosion. It could be easily guarded against.

Q. Easily overcome by protective coatings?

Mr. Evans: We object as leading.
The Master: Sustained.

The passing of considerable quantities of direct current generally produces electrolysis. That is found in large cities where they have street railways and also where they develop direct current for power purposes. You will find it in the down town district here in Kansas City. Electrolysis at Marysville is practically nil. I know of a way that tanks buried underground could be protected against electrolysis. If one dreaded this exceedingly little quantity of electricity, you could make grounds on the tank and carry them to the north and south and attach your zinc and

bury them in the ground and then the current will lead to them. A foot away would be all right. A piece of zinc as big as your thumb would be sufficient for the larger quantity. It would take a large slab. I have had some experience with inflammable gases and vapors such as rise from gasoline, and I think I can say in a general way that I am familiar with the properties of gasoline and the various petroleum products. Any liquid has a tendency to pass from the liquid state to a gaseous state and when it does so we [fol. 305] call it vapor. Vapor which passes from gasoline is inflammable but is not explosive by itself, but if it is mixed with air it is. The proportions which produce the explosive mixture are between one and one-half per cent to six per cent by volume of gasoline to the air. One and one-half per cent of gasoline vapor is the lowest limit and six per cent is about the upper limit.

Q. Are you familiar with the bulletins, technical papers put out by the Bureau of Mines, I mean in a general way how are they regarded among scientists and chemists?

Mr. Doran: We object to this——

The Master: Sustained.

Mr. Bennett: I believe the documents are admissible in evidence without proof so I won't press the question.

Mr. Evans: We deny that they are admissible.

The condition which would produce an explosion or rupture of a storage tank containing gasoline above ground would be to get more pressure inside than it could stand, and as I told you this morning, it might be produced by the vapors being formed more rapidly than they could escape. It might be produced by internal combustion of the vapors within the tank. You would of course have to have an explosive mixture that could be obtained inside the tank only under conditions which would introduce—cause less gasoline vapors to be present in there than would normally be present at normal temperature. If anything happened to cool the thing down suddenly or if you would draw gasoline fairly rapidly from the tank, there would be more probability of that in the winter than in the summer. A tank such as these on a hot summer day when a sudden thunderstorm came up would be rapidly cooled. That would result in the condensation of some of the vapors of the gasoline

and also in the contraction of the remaining vapor portions in there which would draw some air in. There would also be a tendency to suck in air, which is known as the breathing of tanks. The pressure of air changes from day to day and from time to time. When the pressure of air goes up, the barometer rises. Under that condition if the tank remains at constant temperature a certain portion of air would enter the tank driven there to equalize the pressure. Then if the pressure falls a certain portion of the gasoline vapors would come out of the tank just as you take in a [fol. 306] breath and expel it. The tank cools down at night and that will contract the liquid and vapors and condense some of them too and their places will be taken by air coming in. Then as it warms up in the day time the air will come out charged with the vapors. I am speaking of tanks above ground. A tank below ground would breathe in the same way from the barometric changes but the temperature changes would be much less. Aside from such things as drawing gasoline out of the tank and filling the tank wagons or something of that kind, there would be this breathing in process that would produce an explosive mixture. That happens when the tank is cool. I mean it might. The mixture may get too rich to explode. When you have the thing in the right limits you can have a flame spreading through the mixture, burning so fast that it is an explosion and the high temperature produced in there produces an explosion of the gas, produces the disruptive effect when it tears something up. That same effect produces the motion of the car when properly controlled—speaking of the handling of an automobile. That is more likely to happen in a tank above ground than below ground. I judge that there is more vibration with its resulting effect on tanks above ground than below ground because you would have a little leverage above ground which would tend in a way to magnify the earth's motion and the tanks are less steadily supported. I should think you would have greater strain set up in the case of an overground tank from cooling and contracting and expansion of tanks because you would have bigger temperature contractions than you would have under ground. Suppose we imagine a case where the tank standing over night got cooled down to almost air temperature and then the sun comes up in the

morning and plays on the tank. It would heat that part of the tank where it strikes the upper part and if the upper part was not filled with the gasoline and the lower part was, this upper part would warm more rapidly than the under part and the under part would remain about the same length as before while the upper part would be expanded. I therefore think there would be more strain from expansion above ground than below ground. The effect from the sun would be almost eliminated in the case of a tank buried three feet under the earth. There would be a season to season change but hardly a day to day change. It would be a gradual change and much less than above ground. I should think that the joints in these tanks would be more likely to open above ground than below ground although I expect they stand it pretty well. If the screen in a McDonald vent is as fine as I understand [fol. 307] it to be, there would be very little chance of a fire getting down through it unless the gauze gets hot. It will pass if the gauze gets hot enough. When we are talking about the Davey lamps in our class room we take a bunsen burner and let the gas come up through the screen and light it above the screen and it does not burn below the screen until the gauze gets hot in time then the flame jumps through and goes on down. Of course if you set up the case where a building over here fell down and flames came through on the thing they might play on the pipe line long enough to get the screen hot but it would also enrich the mixture so it would not be explosive inside the tank. The only thing I know of would be for lightning to strike it. It would be perfectly possible for it to do it, but conditions would have to be such that there would be more air than usual inside the tank. But of course here again you have the same thing. The conditions that produced the lightning might also bring about a sharp cooling—give this inhaling. Lightning, since the time of Benjamin Franklin, has been recognized as an electrical phenomena. It consists of an electric discharge both ways and generally goes both ways at once, vibrates back and forth and the currents in the lightning flash are very considerable. The Bureau of Standards made some investigation in which they estimated the current in a lightning flash may be twenty-five thousand amperes of very brief dura-

tion but tremendous currents for the time being and because of high potential and great quantity of electricity they are able to produce great destruction. We divide lightning flash into two classes, A-flash and B-flash. A is comparatively simple. It consists of a single stroke and it is the kind of thing that the lightning rod can afford protection from. It may prevent it by leading electricity to the clouds or to the earth and so decreasing the tendency to hit the house or it may guide the stroke safely into the wet ground. Then the B-flash is something different from that and is usually ascribed to conditions such that we have two clouds, one above the other, one negative and the other positive, and a discharge takes place between the two clouds and that relieves the charge on the lower one, but the lower one has been gathering a charge from below and when it is gone to the cloud above, it must pick up immediately to reestablish the equilibrium. Everything is balanced that can be balanced and instead of there being one stroke, it will pick from many points on the earth at once. It seems not to need a certain point and a sharp point is not necessary, a knobby point or anything will do. The B-flash is the hardest thing to protect against. I have been riding in my car during a thunder-storm and [fol. 308] have the sparks jump around the car all at once and see the flashes. I do not believe it was a real B-flash but it came very near it. I remember during a thunder storm in our neighborhood the majority of the trees in our neighborhood seemed to be struck at one stroke. I lost sight of your question. If one of the above ground storage tanks at Marysville were really struck with a B-flash it would doubtless be heated pretty severely, and if there was any leakage of gasoline that would be set on fire and under those hypothetical conditions it might set up and produce internal combustion, but that would be an unusual condition you must recognize. I should think that the chances of an above ground tank being struck would be greater than it would be with vent pipe sticking above ground from a tank buried underneath. The chances of producing a spark are pretty good above ground and of course if there was a chance for ignition, it would give it. The chances below ground would be less because the vent pipes are small. The chance of the direct heat doing any-

thing would be very small with a tank ground because, as I pointed out, the tank below ground would breathe very much less. When lightning hits the ground it goes through the soil until it hits moisture and then it is dissipated. The earth can care for enormous quantities of electricity. A tank buried underneath the ground would be a part of the ground and the lightning pass on through it and have no effect.

Q. Now, Doctor, assuming a tank of approximately—a cylinder tank 10½ feet x 18 feet buried three feet underground in the soil conditions as you found them at the two different properties at Marysville, assuming that a sewer at the Sinclair Company runs in the alley which is sixty to one hundred feet away from this tank, the sewer is ten and a half feet deep. The bottom of the tank being thirteen feet below the surface of the ground what is the likelihood of the seepage or leakage from this tank getting into this sewer?

Mr. Evans: We object as incompetent, irrelevant and immaterial, not a proper basis for expert testimony because this witness has already given his opinion on every element that enters into that. It is only permissible to have an expert's ultimate opinion on things only when the steps leading up to it are not susceptible to analysis. He has told us all about everything that is contained in that opinion or that goes to make up his opinion.

Mr. Doran: It is the Master's providence to find out the ultimate facts.

[fol. 309] Mr. Bennett: We think this is clearly in line with the scope of expert testimony. It certainly doesn't go as far as some other experts have gone in this particular hearing.

Mr. Evans: Ours haven't proved each step that has been taken. When that is done the Master has possession of everything necessary to form a conclusion. The ordinary rule would be a statement of a conclusion——

Mr. Bennett: Here is a lot of testimony that a certain thing is liable to happen up at Marysville, now we take a man up to make these tests——

The Master: Overruled.

Mr. Evans: Exception.

A. Nothing has been said about the nature of the sewer.

Q. Assume it is an eight inch sanitary sewer constructed of vitrified clay pipe with the joints juted and concreted with manholes of brick and concrete at the intersections of streets and alleys and at each end of the block?

Mr. Evans: Same objection.

The Master: And the same ruling.

Q. The manholes being considerable further from the tank than the sewer?

Mr. Evans: Note our exception.

A. My opinion would be that the gasoline would not travel in any appreciable quantity as far as the sewer. My test shows that the soil is pretty impervious to gasoline and then the tendency would be to carry the gasoline up to the surface of the ground long before it traveled that far, then your sewer construction in itself is pretty impervious.

Q. What would say to a similar situation existing at the Standard oil tanks, except that the sewer there is eight and one-half feet deep from the top of the ground?

Mr. Evans: Same objection.

The Master: Same ruling.

A. The answer would be the same.

I have never measured anything in tanks except a Ford tank and have had no experience with the measuring of quantities of liquids in tanks. I have had some experience along the line of what I imagine you want and that is Dr. [fol. 310] Franklin and I carried on joint investigation of liquid ammonia, liquid boiling thirty-three degrees below zero. We had to measure our liquids with great accuracy and I could not construct an apparatus in the ordinary way, so we inserted little glass rods, almost threads, that turned up like a hood and we determined by taking the measurements then the point of the hook just barely broke through the surface and then weighing the volume we could determine our measurements with great nicety. I have been told that that principle of measuring is in practice. It is easy to determine when the hook just breaks through the surface but I never saw the thing worked. That would eliminate the tendency of gasoline to crawl.

All petroleum products will vaporize but of course the lower the boiling point the more rapidly they will vaporize. Those products which vaporize most rapidly of course they have the low specific gravity. Real specific gravity not Baume. But if you want to know the difference between Baume and Specific Gravity, you better ask some of these oil men because the Baume has not enough logical sense to interest me. There are six or seven Baume scales and when a fellow says sixty degrees Baume you cannot tell what it is. I cannot answer a question right off as to which is more inflammable, crude oil or gasoline, because there is so much difference in crude oils. Some of them consist of a very high percentage of easily volatile constituents while others have practically none of these easily volatile things. Of the crude oils that I have actually worked with the range of gasoline content would run from practically nothing up to something in the neighborhood of twenty percent as I recall. It has been some time since I examined any.

Q. Do you have any standard works or tables showing the tests of the various crude oils?

A. I brought with me a volume of our Kansas University Geological Survey on oil and gas and it gives the result of a chemical examination by Dr. Bushong, who was a member of our department at that time, and he was here——

Mr. Evans: We object to what Dr. Bushong says about it as incompetent, irrelevant and immaterial, [as] don't object to Dr. Cady's opinion but we would like to have him be——

The Master: Sustained.

Q. What is the work which you have there?

A. It is Volume 9 of the University Geological Survey on oil and gas.

Q. Is that required by law to be published?

[fol. 311] Mr. Evans: We object as calling for a conclusion.

A. Here is the letter of transmittal.

Q. What does it say?

A.—

"Doctor Frank Strong, Chancellor of the University of Kans.

Sir: I have the honor to submit to you herewith a special report on oil and Gas of Kansas prepared by the State Geologist and his Assistants.

This report will constitute Volume Nine of the Reports of the University Geological Survey of Kansas.

Very respectfully submitted.

Erasmus Haworth, State Geologist."

Q. Is that book which you have there, is that regarded as a standard work on the subject with which it treats?

A. It is official, yes.

Q. You may state what the range of tests and the different types of crude oil disclosed by this work are?

Mr. Evans: Same objection.

The Master: Sustained.

Mr. Bennett: We think it is of the same category as medical works and works of that kind, the matter is frequently read into the record.

Q. Refreshing your recollection from that work, are you able to state what the rate of tests on different types of crude oil is?

Mr. Evans: He is trying to get indirectly what he cannot get directly, to-wit, Dr. Bushong's opinion. I have no objection to Dr. Cady's opinion on these things.

The Master: Sustained.

I have read of gasoline content in crude oil running up to eighty or more per cent. If you have one of those crudes with a high gasoline content it would be as easily inflammable as gasoline and if they had practically no gasoline in them, you would have to build a fire under them to burn them, because it does not contain enough of the easily volatile constituents to form a combustible mixture with the air. I would like to state the basis of comparison because what I really understand—the way I would take it would be the flashing qualities of the oil and in my experiences that has been quite varied. Of course it has been many [fol. 312] years ago since I made the last of these tests. None of them had very high quality when up above normal

temperatures, so they had to be heated very strongly. Others flashed below normal temperatures just as gasoline will flash. It is the volatility of the constituents in the crude oil that determines the flash point. Of course you could start in and determine the flash point. And if you also have the analysis of the gasoline content, it would be all right, you could make a guess. But you would first have to have the gasoline content of the crude oil if you are going to form an opinion in regard to it without actually determining that, that is, as to the flash point. I know Dr. Cross. He was one of my pupils. I think the danger to persons and property from communicated fire would be much greater in the case of tanks above ground than below because the ground is such a poor conductor of heat. It would take a long time to penetrate downward and if it did it would produce slow evaporation of the liquid, which would be taken care of easily. Conditions might easily occur so that the boiling would be sufficiently violent in an above ground tank to throw the gasoline out of the tank and that would increase the violence of the boiling and tend to perpetuate this condition. I do not know as I could tell what a superheater is. One of the experiments that I generally show my class to illustrate the elements of an explosion is this: I take natural gas and run it into a distilling plant and condense it to a liquid air and then take this flask out of liquid air and the liquid natural gas begins to boil with the heat of my hand. Then we light it and then I put my hand under the flask and the heat of my hand boils the water and I say to them, "What would happen if I took this fire and put under it"? I have an opinion based upon the different things that I have testified to as to the relative hazard or safety of underground and above ground storage of gasoline and other petroleum products, and without any hesitation whatever I would say that the above ground storage is much more dangerous.

Cross-examination:

When speaking of the comparative hazards of the above and below ground tanks, I believe I have taken into consideration the comparative opportunities of policing tanks

to discover leakage. I should not think it would be by any means impossible to determine whether there was a leak in a ten or fifteen thousand gallon underground tank. You might not be able to detect it in a day or anything of that kind, but by checking the income and outgo you would soon [fol. 313] get a very good idea. To start with you would have to eliminate from the field of inquiry the possibility of sight. You could not see what was going on underground, as you could with the tank above ground. It must be conceded that leakage and the presence of gasoline and the fumes that will arise from it will be a fruitful source of fire. Assume that these tanks were buried in a great big pit, that in itself would create a pocket in which the leakage would accumulate. The loose dirt would form a pocket in which it would accumulate. Now if that leakage is small it might take a year or two but after awhile it would happen that the ground would become saturated. That might be done even though you checked your leakage by the device mentioned. And if there was a crevice in the earth, it might go through but I think you are not likely to have that in that kind of soil. That is a plastic soil. I know that there are many springs up there but not down on that river valley. They are out in the limestone. I understand that there are wells in that neighborhood. I do not know that; it would be a long far fetched opinion for an expert to say from my drilling up there whether or not there are any crevices that reach the wells. I made no investigation on the south or the west or north of the Sinclair tanks. You better take some of the more local people to get information as to whether or not there is an old lagoon or swale there. Not having drilled in any other place, I could not say whether there might be a dozen crevices there for all I know or not. The holes I dug are about two inches in diameter. I had a man drilling there and I got my information from listening to him talk. Either gasoline or water will penetrate dirt that is thrown back into a hole more readily than it will in a hard hole. The soil I made the experiment with was saturated with water, that is the state it is in naturally. When it is thus saturated with water the gasoline will not so readily penetrate it. Nothing in the way of earth is impervious to water, and it

is not as impervious to gasoline at it is to water. Gasoline will leak through cracks that will hold water pretty well. That yellow gumbo gets very hard and dry on top and cracks. I never did see a crack ten or twelve feet deep. There is such a thing as electrolysis and it affects iron pipe, but there is not as much difference between galvanized pipe and [gas] iron pipe as there is in the case of corrosion. I do not know anything about the investigations that were made in Kansas City and Topeka by the gas company about electrolysis, but I had some experience in St. Joseph in connection with the trouble they were having with a long series of natural gas explosions occasioned [fol. 314] by leaks in the pipe caused by corrosion. We found that both the service pipes and the cast iron mains were affected by electricity. Cast iron and even galvanized iron will be affected by it, and it was electrolysis that caused the pipes to leak in St. Joseph. I did not find places where there wasn't electrolysis where they were injured and full of holes. Water will carry oxygen into the earth and create corrosion. Erosion or corrosion or whatever the destruction of the tank happens to be can take place from within as well as from without and that painting on the outside won't protect from within and it will go on as rapidly inside whether it is below the surface or not. I think it perfectly possible for tanks filled with gasoline or coal oil to erode from the inside. You get water in your tanks when they are being filled and refilled with gasoline or coal oil day after day. If I put one of those tanks under ground I would fix it so that I could draw the contents out. I would give it a slope to one end and pump it out. I would not make a sink at the bottom of the tank, I would put the tank on a little slope and put a sink in that way, let the water run down in it and then you could pump it right out. Your air would come in the same way you would take the gasoline out. You would have to pump the air out too. You would have a comparatively small quantity to take out at a time. I would pump it out into a can or bucket and separate in the easiest possible manner what gasoline comes along with the water. You could get your water just as readily below ground as

above ground. I would put in a blower. I would also put in a system by which to dry the tank out but I suppose that is already known. I suppose it would not be much trouble to devise one. I consider the hazard in maintaining tanks above ground this way: How would you like to live in a neighborhood of them? There has been enough accidents where they have proved themselves hazardous to justify such an opinion. I saw the remains of this Hays affair some time after that. I saw the remains of a similar fire out at St. Marys at their auto camping station. The tank was burned up. Of course I was not there, the caretaker talked about the thing. There were a number of trees—I observed the trees that were burned around there and the tank was crumpled as it might naturally be after heating intensely, and I think it had a tear in it, but I do not believe I had better swear to that. I have seen a great many wrecks and remains of fires other than tanks, more remains from business houses and residences than from tanks.

[fol. 315] Q. Now assume that the Standard Oil Company has nine hundred of these above ground tanks in Kansas and that there are twenty-three hundred other above ground tanks and that there never was but one explosion and that was at Hays, would you assume that the maintenance of tanks above ground was extraordinarily hazardous?

Mr. Bennett: We object as assuming something not in evidence.

The Master: Answer the question.

A. Well I would say that the chance of one dying some other way would be larger than one dying from explosion of one of these tanks a good deal. Extraordinarily hazardous.

It is more hazardous than the maintenance of any other kind of property in the cities of Kansas. I base my opinion on this: that my house and the houses in Lawrence are a good deal safer propositions than these tanks, yet I have known of a number of houses burning in Lawrence and have never known of an oil tank burning there. I have lived in Lawrence over twenty-five years and I do

not know that we have had any fires from above ground tanks. We have had dry cleaners burn. We have had tank cars get afire.

Q. Do you think they ought to be buried too because they burned up and the dry cleaners likewise?

A. The dry cleaners are pretty good people.

It is a singular fact that released electric current or straying electric current when it enters the ground will return to the ground to its sources in a circuit and if there are any iron pipes it will follow them if it is easier to follow them than the ground if they are going the way it wants to go. The moment it strikes the pipe it will follow it until it becomes a greater obstruction than the earth, then it jumps off into the earth. These currents in the earth travel through the moist portions and it will get off perfectly easy without a spark. The destruction of the pipe occurs when it leaves it—if it is a direct current. Alternating currents affect pipe very little but some, like buying a newspaper affects one's income. I did find some current in the ground there at Marysville, but I say that the volume was small and I did not think it would affect pipes. The absence of electricity from the ground to-day is no evidence that it will be absent tomorrow in this modern age—only so long as the conditions are not changed. They are building transmission lines all over this state carrying [fol. 316] very high power current, but it is all alternating current because if it is direct current you would have to use a prohibitive wire and the cost would be prohibitive. I would be exceedingly surprised if the plant now being erected at Tecumseh provides for the transmission of direct current. They send out alternating current and transform it into direct current. There is one little town we did have a direct current system there some years ago and they possibly have it yet, but those direct current systems are a thing of the past. In the down town districts they have the direct current for certain special purposes. There is no reason why this town up there should want direct current. It would be uneconomical. It has been eight years anyway since we changed our plant at the university to alternating current. They changed to the alternating current because even for the comparatively short transmission distance around the place they could do it a good

deal better. The wires that they run our direct current motor there with, the copper inside was pretty near as big as my thumb, and changing it to the alternating current it changes to the size of a small stenographers' lead pencil, not as big as those there, however, the smaller kind. I have never been connected with an oil company as engineer or in the construction of any of its plants and have no actual experience in the storing of oil and gasoline. A tank above ground with an ordinary vent in it would be more susceptible to being struck by lightning than an underground tank with a vent protruding from the ground because it exposes a bigger area. The grounding wires on the tank would protect it from the A-stroke. The B-flash is liable to go anywhere. It spreads out. The system I spoke of for putting some kind of connection in the bottom of these underground tanks would be like this: You fasten your zinc plate—it is a good metallic conductor—with the tank and make a plate if one were afraid of this feeble current—if it was my tank I would not be afraid of it—you would fasten it—I would make it a biped—if I had one of these tanks buried underground in the way Mr. Bennett's question described and you went up there and emptied into it some gasoline or coal oil that had been shipped through that air down to fifteen degrees below zero, the effect of course would be to cool the tank and cause it to contract somewhat, but I do not believe there would be sufficient contraction to cause it to split the seams and burst it. I have a pretty fair idea of how much the iron would change. Of course you can easily calculate it. I think the more severe strain would be set up on rapidly varying summer days when the tank was above ground. On a summer day [fol. 317] the under part of an above ground tank where the gasoline is will stay cool while the upper part heats. Certain crude oil has a lower flash point than gasoline. You could get some crude oil with flash below room temperature. Crude oil that slopped over on the ground would generate fumes, that is, some would, others would not. Some of our Kansas crude oil would not give off any vapors that you could set fire to. It flows like that at some of those wells. There are quite a good many of them. Any crude oil will make gasoline by cracking, but some won't by distillation. It will flash at ordinary temperature if it has

gasoline in it. There is a difference between crude oils and when you ask me whether the flash point of crude oil and gasoline are the same, it is a good deal like asking me "How dangerous is a dog?" I have seen some dogs I am not afraid of. There are many ordinary crude oils that do not have as low a flash point as gasoline and many that do have. These low gasoline content oils are common enough. An under ground tank would breathe from barometric changes just as a wind cave up in South Dakota breathes but it would not breathe appreciably from temperature changes because they would be too slight underground. I have seen some very rapid barometic changes. We have a recording barometer in our office and sometimes it goes down terribly, now and then right up, and that is rather characteristic of a thunder storm condition and also you can tell from that whether the conditions are favorable to the formation of tornadoes, whether there will be a rapid change, and I have seen the temperature change very suddenly indeed. I remember of a line coming around pretty stiff and of dropping all at once seventy degrees in a very short time. You know in the summertime when you get a hailstorm it is a pretty sharp change. We had it demonstrated this morning that these gasoline vapors were heavier than air and the air coming in would lie along the top of the tank and while I think it would not make an explosive mixture throughout the whole thing, I still think it would be in portions. The stuff that would change your air, the gasoline vapors is a liquid and it is down below. The liquid—the bulk of the gasoline vapors is on the top and in between the top of the tank and the liquid itself there is a point where if you had clear air at the top of the tank, there would be an explosive mixture at some point in the tank. I suppose tank wagons are vented somewhere. Of course they are a good deal smaller and in moving you have the slopping around. I should think the air would become saturated much more rapidly. If the tank wagon stands [fol. 318] for days at a time in the street, you would have the same condition you would have in a tank. A good many Fords and other automobiles burn up. But you have this slopping around which would equalize it quickly. When these garages are full of them and they stay all night—you would not have a hail storm on the gas tank in the garage.

If you were out on the prairie and stopped you would get pretty wet before the tank would. I do not believe you do get the same conditions in a tank wagon. I agree perfectly with your witness that your gasoline will change your air to the point where it would not explode. When it is heating up so that the fumes are driving up into the air, you cannot get fire into the opening. If you shoot holes in the bottom of it so that the oil or gasoline runs out, of course that adds fuel to the flame and makes more heat and danger.

Rollie B. Terrill, called as a witness for the plaintiff in rebuttal, testified as follows:

(Trans. of Ev., 3, pp. 554-557)

My name is Rollie B. Terrill. I am postmaster of and also in the confectionery business at Robinson, Kansas. I recall the fire at the Kimmell Oil Plant in Robinson along about the first of December, 1923. I examined the tanks that were in the fire and found that the manhole only had a vent pipe. Manholes are screwed in with a little pipe. I have seen manhole vents similar to plaintiff's Exhibit F and the Kimmell tanks were not equipped with them, that is, were not equipped with manhole vents similar to the manhole vent shown by that exhibit. There were a lot of cedar poles and I think some ties between the plant of the Kimmell Oil Company and the box cars that were burned on the track. I would judge that they were piled over twenty-five feet from the warehouse and plant but not that far from the upright tank. I saw gasoline running from the tanks after we had the holes shot in them.

Cross-examination:

I made the examination of these tanks the day after the fire. We call these caps in manholes. They are about eighteen inches across. In addition to that manhole these tanks had vent pipes. There were two tanks standing horizontally and one standing upright and the fence and cedar poles and ties were between them and the railroad track. These things were piled up close to the track. I do not be-

lieve there was four feet of space betwen the ties and poles [fol. 319] and the box cars. That is my estimation. I did not examine them because they were burned down. Our Commercial Club met with Mr. Kimmell afterwards and he agreed to put his tanks back. We wanted him to fix his station so it would not be as hazardous. We did not feel that it was hazardous setting above the ground, but we wanted him to equip the tanks with safety valves. We did not want that to happen again.

D. P. Sims, being called as a witness for plaintiff in rebuttal, testified as follows:

(Trans. of Ev., Vol. 3, pp. 557-559)

My name is D. P. Sims. I reside in Hays, Kansas, I am a scenic artist, and previous to 1920 I was employed by the Standard Oil Company. I remember the fire at the Standard Oil plant in Hays, Kansas, on November 17, 1919. The large tank that has been mentioned in the evidence was equipped with a manhole with a cast iron cover perfectly solid. It was near the middle of the tank and at the north end was a McDonald safety vent. The tank was not equipped with a manhole vent similar to the one used on plaintiff's exhibit F.

Cross-examination:

It had a McDonald vent on it. I was salesman for the Standard Oil Company at that time but was not there at the time of the fire. I worked for the company four years but have not been with it since 1920. The manhole of which I was shown a model was, I think, in use by the Standard Oil Company at that time. I do not know whether it is listed and approved by the Underwriters Laboratory and I do not know as a matter of fact that it is not so listed there. I do not know whether that device belongs to the Standard Company alone and no other company. I would not say that that was a fact.

Mr. Bowman, recalled as a witness for the defendants, testified as follows:

(Trans. of Ev., Vol. 3, pp. 559-566)

I testified the other day that I was employed in the Division Engineer's office of the Union Pacific at Marysville, Kansas. We have the St. Joseph, Grand Island and Topeka Branch, Topeka to Marysville, Manhattan branch and the Leavenworth branch. The Central Division is known as the Central Division. I am familiar with the regulations of that railroad company for the storing of gasoline and fuel oil.

[fol. 320] Q. What is required by the Union Pacific in the storage of their own gasoline?

Mr. Doran: We object as immaterial.

The Master: Sustained.

Mr. Bennett: Our theory was that we expect to prove that the Union Pacific requires all the storage of their gasoline and fuel oil to be buried and we expect the witness to tell why they store gasoline in large quantities similar to that which the plaintiffs keep underground. We expect to go further and show some experience they have had with the underground storage.

Mr. Evans: The rules of the Union Pacific haven't anything to do with this case.

Q. How does the Union Pacific store its gasoline and fuel oil?

Mr. Evans: We object for the same reason.

The Master: Same ruling.

I know of two tanks of about 8,500 gallons and several smaller ones underground. One is at Marysville and one in St. Joseph. They are ordinary tank cars taken off the tracks and buried. I have known from my own knowledge that the one in St. Joseph was there in 1912 and has been there ever since. It is right to the side of the tracks just down south of the turn table in the St. Joseph terminal yards and just north of the turn table. I do not know that the soil that it is buried in below the surface but there are cinders around the top for ballast like in railroad yards.

The tank has only about two feet of earth over the top of it. We have never known of it if we have had any leakage. We store gasoline in it which is used in the Santa Fe motor that runs on the St. Joseph branch. It was put there for the St. Joseph and Grand Island motors running to Hiawatha. The tank buried at Marysville has been there ever since I have been at Marysville, five years. It is down in the yards of the store department. There are no cinders there; it is just buried under the ground. It has never leaked that we have been able to determine. I have never seen the St. Joseph tank cleaned out but I know that it has been cleaned out.

Q. Why do you bury these tanks?

Mr. Evans: We object as incompetent, irrelevant and immaterial, calling for a conclusion from the witness and not tending to prove any issue in this case.

[fol. 321] Q. Why did the Union Pacific bury these tanks?

Mr. Doran: In addition to that I don't believe he could tell, it would be hearsay.

The Master: Sustained.

The railroad company stores gasoline in small quantities at section tool houses in fifty barrel drums. They are all above ground and the gasoline thus procured is used for running little motors cars. We bury all fuel tanks at water pumping stations. That is a three hundred gallon welded tank, in some cases reconstructed and old boilers. We have some 270 gallon galvanized tanks buried.

Mr. Doran: We object to all this as not comparable to our tanks. The evidence doesn't establish any issue in this case.

The Master: I don't think it is very material.

Mr. Bennett: It goes to the matter of corrosion, to show they have all different kinds of tanks buried in cinders in the ground, and they don't corrode out.

Mr. Doran: We object to it for the reason stated.

The Master: Sustained.

Mr. Bennett: Note our exception.

Q. Do you know of any instance where a galvanized tank is buried?

A. Yes.

Q. Where?

Mr. Evans: We object as being immaterial and not comparable to the tanks in use by these parties.

The Master: I don't——

Mr. Bennett: We want to show that they buried all different kinds of tanks around railroad yards in cinders and have very little trouble with corrosion. There has been testimony to show that iron will corrode out overnight almost and we want to show that the railroad company has very little trouble from that.

The Master: Sustained.

Mr. Bennett: We desire to save an exception to the ruling.

[fol. 322] Cross-examination:

We have never had any fifty gallon drums buried. I do not know the specifications that are required by the M. C. B. for the construction of tank cars. I do not know what pressure tank cars are built to resist.

Redirect examination:

They are built of steel. The fire protection engineer on his last semi-annual report required that all storage of gasoline at section tool houses must be buried tanks. They are the only tanks we have unburied at present.

Roy L. Simpson, being called as a witness for the defendant, testified as follows:

(Trans. of Ev., Vol. 3, pp. 566-615)

My name is Roy L. Simpson. I am City Manager of Excelsior Springs, Missouri, and reside there. I have had engineering training. I attended the Engineers' school at Kansas University. I took there mechanical and electrical engineering, specializing in that. My practical experience after I left school—immediately after I left school I did electrical work as a journeyman electrician in Kansas City, Missouri, and Kansas City, Kansas. During this time I

was employed on the appraisal of the Metropolitan Street Railway Company in Kansas City, Missouri, subsequent to which maintenance electrician in the Kansas City, Missouri, water works in the Quindaro water works for approximately a year and either just before or after that, I helped put the electricity in this building, the pipes and wires and various circuits and electric lines. I later had some experience in the petroleum industry. I grew up in an electric light plant at Clay Center, Kansas, prior to going to Kansas University and then in the engineering work, aside from the work I have mentioned, I have done electric installation, power and light work all over both Kansas Cities. I have supervised the construction of electric light and water works plants at Butler, Misouri. That is roughly the line of work I did. When I left the Quindaro pumping plant I took a job as superintendent of construction of a casing head gasoline plant at Sedan, Kansas, during which time I was in the employ of the Hope Engineer and Supply Company, whose main office was then at Pittsburgh, Pennsylvania. After that plant was completed, I went to Henrietta, Oklahoma to finish up a plant of the same nature already started belonging to the Henrietta Gas Company. Then I was on the road for the [fol. 323] Hope Engineering & Supply Company selling and installing gasoline and oil equipment and what they call shooting trouble on them—something that came up beyond the local men and they would call for help. Subsequent to that I built a plant at Nowata, Oklahoma, for the Ajax Gasoline Company, which had the same organization as the Diamond Refining Company of Kansas City, Missouri. After that I went to work for the Wolverine Oil Company, a subsidiary of the Texas Company. I built one plant in the Hog-shooter district southeast of Bartlesville, Oklahoma, then enlarge one plant at Osage and one at Bartlesville. All told I have constructed or rather reconstructed fourteen or fifteen casinghead gasoline plants. That involves—after I had gone along as Superintendent of Construction of two of these plants, I was made Chief Engineer of the Wolverine Oil Company, which entailed designing the construction of these plants and which involved handling all its product and shipping it. I have had quite a little experience as consulting engineer in re-

finery work and casing head gasoline. I have been employed in the Cosden Refining Company's plant at Tulsa, Oklahoma for ten months as acetylene welder. The oil business is rather unstable in the ability to employ men regularly and at the time of a certain slump in the price of oil I was beginning a design of a plant and was not able to complete it and for that reason I took the job of an acetylene welder and I had ten months of experience at Tulsa, Oklahoma, where I had privilege of being in all manner of tanks, stills, pipe lines, boiler houses, engine house work, etc. I worked for fifteen months for D. Foster, a consulting Engineer at Tulsa, who before that was Chief Engineer in the Cosden Refining Company. I think as I have had quite a little experience with the keeping and storing of gasoline in considerable quantities that I am familiar with it. My experience has been with quantities ranging from small tanks of fifty-two gallons to tanks of eight or ten thousand gallons capacity. I have had experience with storage around a refinery and casing head plants. Casing head gasoline as I refer to it is now known as natural gasoline. In the early days of the industry it was called casinghead gasoline because it was recovered from the mixture of vapors coming from the casinghead of the oil wells. That is a highly volatile and inflammable gasoline. I am more familiar with the physical properties of gasoline. I am slightly familiar with the chemical also inasmuch as I used to run distillation and vapor tests. I am not familiar enough to run a quantitative analysis on gasoline to determine what it is composed of. I took [fol. 324] chemistry under Professor Cady. The term gasoline as I understand it is applied to liquids that are recovered from petroleum or petroleum gases that has a sufficiently low boiling point to enable it to be used through carburetors as motor fuel. It is a liquid composed of hydro-carbons which are in the line of pentants, utanes, etc. It is normally obtained by fractional distillation of crude oil, the higher fractions or more volatile fractions of crude oil. The lighter fractions mix more readily with air at certain temperatures and pass more readily into vapor than the heavier ones. It is natural for the vapors of gasoline to burn when they come in contact with fire. As to whether there are different grades of gasoline with

respect to inflammability is a question that is a little bit difficult. There are grades that are considered more inflammable because they are more volatile. Now that is speaking in general conditions, where the gasoline is kept or handled, but in my estimation it would be safe to say that all grades are dangerous and not take and chances on any of them. There is such a commercial term as inflammable, hazardous, dangerous liquid and all gasolines are included in that term. If you took the cover off of a container of gasoline and applied a lighted match above the container, the vapors above the gasoline would ignite and burn. I could not give it in minutes or hours—the length of time it would burn—it would burn until all of the atmosphere in the room in which it was burning was depleted of its oxygen, or if supplied with an unlimited amount of air, it would burn until the liquid boiled and the liquid would no doubt boil over and burn until consumed. If you had a small quantity of gasoline tightly closed in a container and applied a flame, the chances are very good for an explosion. It is very easily possible over the liquid in that container to have an explosive mixture of gasoline vapors and air and if ignited it would naturally explode. There would be no perceptible burning. It is possible outside of the limits of inflammability or of burning to have a mixture which is too rich to burn violently. There might be a burning that would die out. In passing up to the point where it would become too rich with the vapor, the mixture would pass through a combustible state. A gallon of gasoline will make thirty-five cubic feet of gasoline vapor at atmospheric pressure. As to how much space a gallon of gasoline will make explosive or produce an explosive mixture in—I would have to calculate that. If it is thirty-five cubic feet we will take two per cent which would be within the explosive range. One per cent would be seventeen and [fol. 325] one-half multiplied by one hundred. It would be 1750. If it were six per cent, one per cent would be roughly thirty-five and a fraction and one hundred per cent would be one hundred times six or six hundred cubic feet. It would be possible for a gallon of gasoline to make an explosive mixture in a space ranging from six hundred cubic feet to seventeen hundred cubic feet. An explosive mixture or burnable mixture will be ignited under any

condition that will produce a kindling temperature at which the atmosphere will mix with the vapor. That condition would be a match or a spark made by a violent abraisement of iron or steel. I have had some but not a great deal of experience in handling crude oil. As I understand the question, crude oil is a natural product which is drawn from the natural reservoirs where it is found. It is a combination of a good many components ranging from asphalt perhaps at the bottom to a petroleum, either perhaps at the top the range of volatility. It is a commercial article in what we call the petroleum industry. It is the raw material which goes to the factory to produce the finished article when you consider the refinery as a factory. It is not a commercial quantity as gasoline and kerosene are. Crude oil is a raw material of which gasoline is one of the finished products just like wool from the sheep from which clothing is made. It is the ore in the sense of lead or zinc mines in which the finished lead or zinc is made in the smelter. It is not a retail commercial commodity to any great extent whatever. As to which is the more hazardous, liquid gasoline or crude oil—the average crude oil if we would strike an average under normal refining conditions where the gasoline is separated from the crude oil by ordinary distillation, and allow it a fifteen per cent gasoline content as an average, I would say that at atmospheric temperature there was a very slight difference, if any, between the hazard of handling the one or the other. I am taking a fifteen per cent gasoline content as an average, because when you say crude oil you refer to a long list of possibilities. Some crudes contain almost no gasoline or material that can be made by ordinary distillation into gasoline, while others contain twenty to twenty-five per cent that can be recovered by ordinary distillation. Some of them higher than that, but that of course is a rare case. The conditions that would produce danger from the storage of gasoline in quantities of eight to twelve thousand at supply stations are rather manifold. I would say that one would start with a full tank of gasoline and go through the cycle of possibilities [fol. 326] with that tank and analyze the possibilities and probabilities of hazards, he might ascertain it if he didn't leave out any of the hazards and destructions. The only

influence that I know that would ignite gasoline leaving aside for the time being the danger of igniting the vapors from other sources, is by the contact of flame or sparks or a high temperature, which is high enough to be the kindling temperature of a mixture of gasoline vapor and that can only come about by some external agency from the gasoline itself. It will spontaneously ignite and it will of course vaporize which is the fundamental cause of danger of handling gasoline. I have an opinion as to which would afford the greatest possibility of having the vapors ignite by external influences a supply storage tank located above ground and a similar tank located three feet under ground, both of the same capacity and equipped with vents of the same nature. That opinion is that the tank above ground is much more susceptible to destruction by fire than the tank under ground. There are several reasons for that. A tank that is elevated above the surface of the earth is naturally supported by wood, concrete or brick, and in some cases by steel columns, reinforced concrete piers or concrete piers without reinforcing when old enough to stand loads such as would be the case where you store gasoline in the tanks affords what constitutes a dielectric. There is nothing dangerous in that, however. A dielectric is a substance which when introduced between two surfaces susceptible to an electric charge would act as an insulator or separator of those charges. It is a non-conductor of electricity. A tank supported on a dielectric above the earth form a condenser with the earth as one plate and the tank the other. A condenser is an instrument or a combination of materials which is susceptible to taking and, under certain conditions holding, and under other conditions giving up, electrical discharges. The effect that that would have upon the conditions mentioned on gasoline vapors is that when one has a tank full of gasoline and for any reason withdraws a part of it, he unbalances the electrical condition on the surface of the tank. If he continues that withdrawal sufficiently he will build up a charge on that tank strong enough to produce a violent static discharge which has a high enough temperature to ignite gasoline vapors. I have an opinion as to the relative hazard from external fire to a supply tank above

ground or below ground referring to the possibilities of the application of external fire. That opinion is that the tanks above ground are a good deal more susceptible to the influence of communicated fires than those buried [fol. 327] under ground because the tank above ground is susceptible to heat. It has normally no protection against heat and fire in its immediate vicinity will communicate heat to the tank. The tank being made of steel is a good conductor of heat, all of which would produce in certain conditions a very high temperature of the tank and the contents of the tank, while the tank that is buried is surrounded when not in an open pit by a very good heat insulator, the earth. If the test tube which Mr. Boehmer used yesterday had been surounded by half an inch of compact earth he would never been able with a match to cause the liquid within it to boil over, because of the application of heat. Violent boiling or in other words, rapid vaporization from within. If cold water had been applied to the test tube, a rapid contraction of the contents of the test tube would have occurred and an almost cessation of boiling, a contraction of the vapors which would have caused a tendency to make a vacuum in the test tube. The atmosphere would be drawn down in the test tube by the contraction of the contents and the flame at the top would have been present inside of the test tube. I consider the McDonald vent having in it a gauze screen of some kind or other safety device of considerable merit, but it is not proof against the destruction of the tank by fire getting inside of it. When any part of the vent system between the gauze itself and the tank reached a kindling temperature it would cease to be a safe protector. It would make possible the ignition of the mixture within the tank if it were present in explosive mixtures. I think Professor Cady explained the breathing of tanks as fully as I can. However for anybody that stops to think about it, it is well to know that with changes of barometric pressure we have attendant changes of the density of the atmosphere, the change in barometric pressure can be compared to the change of the weight of an object placed on a scale, for instance if you should place a vessel of water on the platform of a set of scales and you add to that bucket a quart

of water you would readily detect that it would increase the weight of the whole. The barometer is an instrument to measure the weight of the atmosphere on the surface of the earth. When the atmosphere becomes light, when we have that condition there is an expansion of the atmosphere, when it becomes heavy there is a contraction of the atmosphere. You have fixed or very nearly fixed capacity tank under consideration. If the atmosphere becomes heavy the barometric pressure rises. That is attendant [fol. 328] with the contratcion of the atmosphere within the tank—that is not the liquid—normally the atmosphere means the air we breathe but the atmosphere in this consideration is the condition which surounds any object. We have an atmosphere of smoke mixed with air in Kansas City. The smoke is a part of the atmosphere. Following or attending the contraction of the atmosphere within that tank there would be an influx of air. If the air became lighter there would be an expansion of the atmosphere within that tank with the attendant outflow of whatever vapors there were in that tank whether air, gasoline vapors or a combination, now that is called breathing because of the similarity to the action of the air when an animal breathes. It goes in when he decreases the pressure within and goes out when he increases the pressure within. He decreases the average pressure within by making the hole inside of him larger.

The effect of the change of temperature on breathing is similar with changing temperature because of the fact that any gas when its temperature rises has a tendency to expand and if the pressure remains constant will expand and when any gas is cooled at given pressure, it contracts. That is part of the law of gases. I think that is expressed PY-ET.

Well, naturally a tank above ground is susceptible to the influence of any changes of temperature surrounding it. A tank below ground is also. The tank above ground is susceptible to daily and sometimes hourly changes of temperature and a tank below ground perhaps only annual changes of temperature and perhaps ranging over a scale of fifteen or twenty degree Fahrenheit from one limit to the other while a tank above ground—it has an annual

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change, while the above ground is susceptible to the changes over night or a hot summer sun and then a cloud coming up and shielding it from the sun or a cold rain would change the temperature, rapidly. If you consider a tank placed above the ground in the sunlight and subject to the atmospheric changes, the presence of liquid in that tank will tend to hold the temperature of the tank at the same temperature of the liquid insofar as the liquid reaches, if the tank is half full the upper half would undergo a change of temperature while the lower half would remain constantly at the same temperature as the liquid within. If the lower part of the tank became heated the liquid would have to become heated also. But the liquid in the tank would cause the top of the tank to be longer than the bottom of the tank which would cause an unequal condition making the top and the bottom of the tank unequal. I have made tests that would illustrate that, de- [fol. 329] termining the temperature of the liquid and the temperature of the tank. Last August I was conducting some tests and correcting some faults in a plant at Shamrock, Oklahoma, and the discussion had arisen, what the effect of the sun's rays would be on pipes of various exposed surfaces. The primary cause of this test was to determine for ourselves the proper color to paint the storage tanks to keep them at the minimum temperature so I took some pieces of three-eighths inch pipe and painted one sample of the pipe—previous to that I closed up one end of the pipe and I had made for these temperature tests, three eighths inch pipe welded and shut at one end. I placed these pieces of pipe all in the same position and side by side in order to get the same effect from the sunlight, one of them was painted white, one black, and one light grey. The atmospheric temperature was 100 even in the middle of the afternoon. A temperature of the sample that was white, taken by a Tagliabue thermometer, I gave that because they are considered very good. A thermometer in the white sample registered 110 degrees, in the gray sample 118, and in the black, 120. Now this illustrates the fact that even though a tank may be painted white it can be considerably above atmospheric temperature due to sunlight. The effect would be higher with green than white. Any color would be higher than white. I could give an-

other example that might illustrate that. A number of years ago it was customary in pipe lines to put in expansion joints and is still practiced to some extent. However in the oil district the greatest element is normally speed. If anybody brings in a well and there is a pipe line across or close by they get everybody possible and run around and get all the pipe possible and as rapidly as possible they make connections and it has been my experience to put in an eight inch line and in this particular job in order to take care of the expansion we laid the pipe crooked and it could expand if necessary and move around over the field and at one place the pipe made an S bend. This was in the early spring when we laid the line—the early summer. I am to some extent familiar with lightning and its effects. Lightning is the discharge of electricity which has been induced by a motion of cloud banks over the earth, the clouds being one plat and the earth the other of the condenser and the atmosphere the electric. Two clouds may be the condenser with the higher one related to the lower cloud. The motion of these clouds relative to one another or to the other induces a charge of electricity and whenever that reaches the place where it can break down the dielectric it flashes and that is the way we see it. It is not [fol. 330] necessary to have a direct hit in order to ignite or damage property. If I can explain to you, for instance, with the small desk here and the larger desk we will consider them the two plates of the condenser the two clouds, and the chair on which I sit another cloud and there was a tremendous charge of electricity and it finally jumped across, it would make or induce the charge on this cloud and if there was anything close to this cloud and if the earth happened to be one plate of the condenser and some object between the two or the one side it would be affected by the high potential between the clouds and the earth. Then if there are a number of objects around which constitute a condenser which is perhaps—you don't think so but your own body can be a plate of the condenser—you have seen certain conditions when you could run your feet across the carpet and then touch a fellow on the ear and get a spark and shock him. I can illustrate from experience this practical phenomena the effect of a bolt of lightning, some other place than the place it strikes. I had a

very enlightning experience at one time. During the time of my schooling I worked at whatever I could get to do to fill in the time to make a little something and at this particular time I was working for a market gardener who had a large greenhouse, and one evening when we were working in the garden there came up a thunderstorm and we all ran into the glassed over portion of the greenhouse to keep out of the rain. That was built on iron pipes for columns to support the greenhouse. These columns were set on wooden blocks in the earth about six by six inches square and the upper part of this pipe supported the roof and some to hold the glass in and some metal. One of the boys was leaning against the post when a flash of lightning came and he jumped away. Now I had been working in the local electric light plant and I thought I knew it all and when he said he had been shocked I said "you don't know what you are talking about." I said, "I will lean against the post," and I did and a flash of lightning came after I leaned against the post and I got a good charge of electricity and the lightning didn't hit the greenhouse by a half mile or more. I have been between the flash and the place of destruction. I was in Tulsa about three or four years ago and the house that I lived in had a front door that faced the west and there was nothing but open country between this house and the refinery of the Texas Company and several other refineries in West Tulsa and my wife and I sat on the porch for sometime, it was raining a little bit and we were wondering how bad the storm was going to be and east of us to the rear, there was a very severe stroke [fol. 331] of lightning and simultaneously with that stroke or as near as you could tell one of the tanks on the West Tulsa property became ignited. The natural supposition was that the tank was ignited by lightning yet to my knowledge it was not struck by lightning.

I have seen a number of fires and have had three or four myself, one of them south of Tulsa. I started to tell about my fires. This plant was a casinghead gasoline plant operating on the compression method and on one morning when there seemed to be no motion of the atmosphere at all, there had been some of the boys drawing off the gasoline from an accumulating tank, they were filling a truck for some fellows that had come up there for a load of gasoline

but instead of connecting up some pipes in the proper method they were drawing it off in five gallon cans. Naturally with that gasoline there was always vapor from it and a car passed along the country road which was about two hundred or two hundred fifty feet away from the plant and ignited this gasoline. The flames jumped from the car right into the plant, around the buildings, igniting the plant. That was caused from the gasoline doing what I heard some one of the witnesses say, creeping, being heavier than air the gasoline will spread out on the ground. If there is no wind it will just flatten out.

I have had one other tank catch fire and I have seen others and from my experience and knowledge I have an opinion as to the relative danger of fires in oil storage tanks as a result of lightning. It is fairly well known among oil men that a very large percentage of their loss by fire is attributed to ignition by lightning. It is very close over the period of the last ten or fifteen years to sixty per cent. The loss of fire attributable to ignition by lightning. The above ground tank is in my opinion very much more likely to be struck by lightning, more so than the one buried three feet under the ground of the same capacity, each equipped with a McDonald vent. The probability of the underground tank being affected by the indirect effect of lightning is eliminated while the tank above ground is exposed. It is thus eliminated in the case of an underground tank because it is a part of the earth itself. Electricity is a part of the earth itself while the tank above ground is a unit electrically. The tank above ground is susceptible as a unit to a charge to hold or give up a charge of electricity as a unit whereas the tank below ground is not a unit and any charge of electricity that might be by any method passed on to that [*take*] is immediately dissipated into the earth, itself being a part [fol. 332] of the earth. I have a decided opinion as to the feasibility of protecting above ground tanks by grounding the ground wires from the effects of lightning. If I had an above ground tank I would prefer that it was not grounded for the reason that even if it is grounded it is slightly more susceptible to a direct hit. Now about welding and the difference between a welded and a riveted tank at the seams. A riveted tank at the seams with the modern

method of boilermaking, the plates are lapped, riveted together and calked, which allows those seams still to remain apart from one another. In a welded tank the metal is fused together and becomes continuous. If you weld two pieces of boiler plate together they become one piece the same as if you melted them up together and made steel of them. I have had practical experience with welding. It covered steel and cast iron. I would hesitate to weld aluminum but I have welded brass.

My experience was largely with acetylene welding, although I have done some electric welding. I welded the roofs of fifty-five thousand barrel tanks that way. I have had several instances of practical experience which would illustrate the strength of a welded joint.

In the construction of gasoline plants it is necessary to make or provide condensers and it was our practice to make our necessary fittings at the plant instead of purchasing them from the factory. Instead of manifold and special fittings, in this instance the manifold is a piece with a number of outlet pipes protruding, in order that you might lead a stream of vapor through this manifold, distribute it into a large number of small streams to the small pipes and these are made by taking several sized pipes and putting two inch nipples or collars welding them into the side of this pipe in order to make it possible to connect these small pipes to them—we call them coils—these nipples are made of standard pipe, these manifolds are all made of standard pipe which can be purchased at ordinary stores. The manifolds were tested by hydro-static tests. To do this all outlets were closed except those necessary to use in the test and then filled with water and then we applied pressure. It was inconvenient to carry a boiler test pump around with us so we always had bottles of oxygen with us, after filling the fitting with water there is no danger of explosion if the job was ruptured because the water would lose its force immediately. We applied one thousand pounds pressure to these fittings from the bottle of oxygen in order to test them with no rupture. We never had a failure with any of them. Then another instance of a welded job came in my experi- [fol. 333] ence at Nowata at a little place they call Curdy's Bluff. We had to cross the river with a six inch standard

pipe line. We figured we had to use that. It was hard to obtain in quantities in the oil fields so we used six and five-eighths inch casing which is thinner walled than standard pipe, we used what we called catenary, similar to a suspension bridge put a cable across to support it. We would weld three or four joints and slip them out and keep on at that. In the careless method they employ there sometimes we didn't fasten the supports carefully to the pipe and some of the supporting lines slid back on the pipe. It seemed that the weight of the pipe kept working the supports back on to the support next to the free end of the pipe until it was four lengths of the pipe away from the end. They were roughly from eighteen to twenty two feet and each probably averaged nineteen to twenty feet in length. That made anywhere from seventy-two to eighty feet 6⅝ inch casing supported by a weld and it wasn't in a vertical shape I mean at an angle like you would hold a yardstick out in front of you. That weld was made by an acetylene welder we just picked up around there. The weld was made by one of four welders that we had working on the line and I don't know which welder made the weld. They all had a part in it so with the support of that seventy-two or eighty feet of pipe and an acetylene weld around the pipe it looks to me like acetylene welding is pretty strong and reliable.

I don't know what the weight of six and five-eighths inch casing is at this time, but it is something like sixteen pounds to the foot.

I spoke of an S bend in a gas line raising up six feet or so. It was welded and it didn't break. That line is still there. It was put in in 1914.

Electrolysis is produced by a current of electricity flowing in one direction—direct current it is called. In order to give rise to this electrical condition there must be a source of direct current. There must be a method by which that direct current can find a circuit through something. Electrolysis takes place at a junction between an electrode and an electrolyte. Direct current plants are the source of the menace of electrolysis. I have never heard of it occurring where there was not a direct current system. Electric railways are sometimes operated by direct currents. In the east a good many are alternating current.

Line loss is a loss of energy due to leakage, and the alternating current generally has more leakage. The only con- [fol. 334] dition where current conditions are favorable to electrolysis would be one end of a direct current system grounded intentionally and the other end becoming grounded. The rails are a part of the earth as far as electric conditions are concerned. The other side of the circuit is the trolley wire. A street car is a connecting medium between the two ends of the circuit which completes the circuit to go through to the rails. It is naturally supposed that the rails would be sufficient conductors to carry that current without dissipating it into the ground but they found the ordinary bond of two pieces of steel afford such a resistance that the current strayed into gas lines and water lines and strayed along where it leaves them. By coming through a zone where the earth was a fairly good conductor or something had contact with the rails where it leaves the end of the pipe or rails you will find a gas line or some other pipe close by. It would have to leave that pipe somewhere, perhaps at the end of the pipe; perhaps over a greater area and that is where the destruction occurred.

Line loss is a term and from either kind of current is very small. In the line loss of a direct current system where a metal circuit like you would have in a city, if you put in an ammeter which is the measure of the quantity of electricity on the outgoing circuit and ammeter on the incoming circuit, they will both read the same. There can't be more current leave a plant than comes back to the plant in either circuit. When you buy it you think, "I am buying so much current" but it goes through your lamps or motors and goes back to the plant in either direct or alternating current. That line loss does not necessarily go through the ground. Line loss from alternating current will not produce electrolysis in any easily detected quantity.

Q. Assuming that conditions in the City of Marysville where there is no direct current other than that which is parallel to the line of the railroad for use in operating the telegraph system and located I think approximately two hundred feet away, and assuming that the tests made show an amount of the current which couldn't be detected by

reading on the ammeter which would measure one one-thousandth of an ampere what would you say as to whether or not we would have electrolysis up there at the City of Marysville?

Mr. Evans: We object as incompetent, irrelevant and immaterial, calling for a conclusion and for the further reason it is asking one expert to predicate an opinion upon the tests of another expert. If I understand it it must be the [fol. 335] results of his own conclusion and not the result of somebody else's conclusion.

The Master: Sustained.

Mr. Bennett: We save an exception. We are asking a hypothetical question.

In my opinion it would take a very strong vibration to effect a welded tank buried three feet under the ground, such vibration as might occur when there is earth tremors or earthquakes. I have no idea that the passage of railway traffic on a line from two to three hundred feet away from the location of the tanks in the ground would affect any at all. Tanks above ground normally supported by two or three piers would naturally be influenced more by tremors than a tank under ground.

A manhole vent shown in the plaintiff's exhibit "F" would be sufficient to vent a tank under all normal conditions, but if it would stick you might get a condition where you wouldn't get a venting. Under normal conditions, I mean the conditions met in the industry, temperature and weather conditions. I don't suppose that device is small enough to hold back any pressure created by fire unless it was an explosion in the tank, and in that case an eighteen inch manhole would not be sufficient to relieve the pressure.

Q. What do you regard from your knowledge and experience as the maximum—no, not that word—the device which will take care of these abnormal conditions if there is such a device?

Mr. Evans: We object to that as assuming a state of facts not proven. There is no evidence of any explosion within the tank in any case and that is the only exceptions that this witness has referred to.

Mr. Colmery: I suppose in these explosions no one will ever know whether the flame went inside or what happened.

The Master: Objection sustained.

That internal explosive condition would be created by the ignition of an explosive mixture within the tank. First there would have to be an explosive mixture, next it would have to be ignited by heating any portion of the tank exposed to that explosive mixture. There are other devices or contraptions in the nature of venting devices used to take care of what might be termed maximum pressure. [fol. 336] They are large openings acting similar to this Exhibit. A number of them are placed on the tank with the hope that they will reach the point in the tank to relieve the pressure that will be produced if the tank or vapors were ignited in the tank. There is not in my experience any other than a number of these different devices that are used. The floating roof is a device by which the size of the tank is only sufficient to maintain the liquid. It allows no free space above the liquid and in that case there can be no explosive mixture above the liquid, but that is not a device to relieve vapor pressure within the tank because no vapors could be present.

I am very decidedly of the opinion that the venting device shown in plaintiff's Exhibit "F" will not relieve the pressure or protect the tank, but it would take care of normal conditions.

I have had experience cleaning out tanks, not storage particularly, but tanks that have had gasoline and oil in them. As far as I can see there is no difference in the hazard of cleaning out a tank above ground and below ground. It is a hazardous procedure in every case, and in both cases you have the tank surroundings of similar conditions inside. It is the pressure of the atmosphere inside that makes it. The atmosphere will not support human life. Tanks cleaned above ground have that atmosphere in them, too. When they are cleaned out they surround the man that goes in with certain safeguards such as helmets, gas masks and one thing or another by which a man could be supplied with things to support life. It would be cleaned underground in the same manner.

If pockets should be formed in the loose earth around a buried tank in which vapors from gasoline would form, one way by which they could be overcome would be to tap the earth in tamp by a mechanical means. Another is to wet it sufficiently to settle it and form a solid base. If the dirt were loose around such a tank and the gasoline were escaping from a leak in it the gasoline would be distributed in that loose dirt to a certain extent and the vapor would come up through the loose earth.

I know what is meant by a tank floating out. It is floated out of its position by the fact that the tank is surrounded by water and that the height of the water is greater than the weight of the tank for the same reason that a cork or a ship floats on the surface of the water. It may be guarded against by making the downward weight more than the [fol. 337] buoyancy of it. One method of that would be to super-impose enough earth on top of the tank. Another by anchoring the tank. One method of anchoring it would be to place in the bottom of the hole enough weight to fasten the tank to—concrete slabs or piers to have the tank held down to. Another would be to put beams across the tank. The easiest method would be to cover up with earth.

Cross-examination:

I would consider that there was the same hazard of fire in the case of a tank of 500 gallons and one of 10,000, that is under the same conditions, and that would also apply to explosions. Distillate would give off vapors similar to those given off by gasoline, and they will explode and burn just the same as the others at the same temperature, but there is not so much of them from a like quantity of fluid. I would recommend universally the burial of all tanks containing distillate as well as gasoline. It would be a good thing to bury a 500 gallon tank as well as a 10,000 gallon tank. It is the exposure of gasoline to air that creates the explosive mixture. Gasoline has a natural tendency to vaporize.

The very fact of leakage of gasoline or fuel oil, or any other product of petroleum would create vapors. I wouldn't consider leakage one of the most important elements in fire hazard—not unless there were specific con-

ditions defined. Vapors in sufficient quantities turned loose from these fluids would be liable to take fire if in the proximity of the flame. If a leakage was sufficient to give off the explosive mixture there would be a hazard from that leakage. I would consider that a tank overground will leak earlier in its history than the same tank underground because the tank underground is not susceptible to the change in temperature in the ground as the tank above ground is. It is true a tank above ground would be more easily policed. If there were any leaks they could be discovered and repaired more readily than in the case of a tank underground. Therefore I would say that the overground tank would give more ready policing, and if policed properly, the leaks could be discovered very easily and readily repaired. That condition would not prevail as to any underground tank. It might be difficult and it might not be difficult to discover whether an underground tank had a leak in it or not. An instantaneous method of discovering a leak in an underground tank as easily applied [fol. 338] as observatioon of the tank on the outside of the ground is not obtainable, but a record of the stock put in and a record of the stock taken out of the tank will give you a check of whether or not there is a leakage.

That method would be subject to the ordinary errors of the ordinary man. He can make a mistake. There would be an element of evaporation to take into account in both cases. You can readily tell the leakage in the above ground tank by observation, but not by direct observation in an underground tank, and it would not make any difference in an overground tank whether you measured the evaporation or not. You would have to calculate the amount lost by evaporation in an underground tank if you want to know absolutely the difference, but your percentage of evaporation is so small it is negligible. It is always there, but tremendously less in underground tanks than in above ground tanks. I could tell whether the gasoline lost in an underground tank is lost by leakage or evaporation, if there was enough to lead me to believe there was a leakage. The only method I know of for discovering leakage in an underground tank is the quantity lost. I would be able to have a very definite idea whether the loss was due to evaporation or leakage. I would check the amount of the loss with the

amount of evaporation loss which would be reasonable to expect and if it was not over that amount I would consider it evaporation, and if it was over that amount I would consider it leakage.

There is no fixed standard for all gasoline -or determining the amount of evaporation at a given temperature. Different kinds would evaporate more readily than others. As to whether or not leakage from an underground tank not discovered would in time cause a storage in the earth of a quantity of loose gasoline would depend on the permeability of the soil. If it were permeable it would no doubt seek its escape toward the point of least resistance. If that led into a cellar or cistern or well it would be possible for vapors to be created there that might become explosive. If the quantity of gasoline soaked into the earth were large enough and the equilibrium is reached it would come to the surface of the earth by capillary attraction, but if you had a submerged tank there would be no gasoline come from the tank. If the gasoline was loose in a cavity in which the tank was buried and the gasoline filled it up it would not come to the surface. Whenever the level of the gasoline reached the level of the gasoline in the tank there would be no further rise. There would be a very slight fraction of an inch capillary attraction. It would be possible that the [fol. 339] fumes would come up, and the fumes that came up would burn as long as they were above the surface of the earth.

I did not graduate at the Kansas University, I took some courses there. I am not a graduate of any university. I took my undergraduate work at the Kansas University. I took the five year course of qualitative analysis and inorganic chemistry, and finished that course either in 1907 or 1908. I took no other schooling in chemistry after that and went to no other school. I finished at K. U. in the fall of 1911 or spring of 1912, and as far as my resident school was concerned that finished my work. I am within a little of being 40 years of age.

It would depend entirely on the mixture of gases coming from the tank as to whether or not when there is sufficient pressure within the tank to raise this manhole vent weighing about 20 pounds, the flame would go against that pres-

sure from within enough to introduce itself into the tank. If it were gasoline vapor only it would not. If it were an explosive mixture it perhaps would. The mixture by percentage of air and gasoline vapor which you necessarily have to have in your motor car would be the same mixture approximately that would enable that flame to travel inward more rapidly than gas was traveling outward. That condition would enable that flame to go back in there, run back into the tank. That is under the condition that the flame was present without.

I don't know for sure whether I have included all the conditions or not, but I will make the assertion of the complete conditions as I see it that would enable the flame being introduced into the tank against that pressure necessary to lift that manhole cover, providing that manhole cover is defined in weight, because that determined the velocity of the vapor. I don't remember that you gave me the weight of the manhole cover, but I do remember some of the other parts of the question. I am assuming that it is an 18 inch circle. It would not be the fact in the case instanced that the vaporization within the tank would in the meantime produce enough more vapor before the manhole was opened to enrich the mixture within the tank above the explosive mixture.

I don't remember which is the more expensive, welding or riveting as applied to tanks. I am a welder but not a [fol. 340] riveter. I have welded tanks but not riveted them and have never done the work commercially. As the foreman of a shop I find that I can buy welded tanks more cheaply than riveted tanks when I take into consideration the problem of leakage. I have not had occasion in any of the various positions held in construction of plants and superintending of works to investigate and ascertain the relative cost of welding and riveting.

The pressure of gas or vapor within a tank is evenly distributed so that the pressure on the vent or manhole on top of the tank would be evenly distributed upon all of the exposed parts of that cover.

The element of vibration and the possibility of the joints and seams being thereby weakened—at a given thickness of metal—is the same in a small as in a large tank—about the same. I would assume that if the joints under considera-

tion were made the same, of the same thickness and the same material, the effect would be the same. That is merely an assumption, but it is the closest approach to it that I know how to make because I have never made any tests. I have never had occasion to study the effect of vibration upon tanks underground or above ground either, nor have I ever had occasion to study the effect upon these tanks of the weaving motion that is produced by filling them. It is possible that there is such a thing as weaving of a tank caused by filling, but I have never seen it. But I have seen tanks filled.

I don't want the master to understand that I have never seen a tank weave. I have seen stills crawl on their settings, and tanks when a tremendously hot mixture was put in, but I have never detected any remarkable vibration in a storage tank in ordinary conditions. I have observed storage tanks vibrate from being filled. It goes to the extent that the one which I was on shook vigorously until I felt safer by getting off. I know that there could not be such a weaving in an underground tank. The weaving probably has a tendency to weaken the tank at its joints, but I don't believe I know of any reason why there should be any difference in the amount or quantity of that weaving in a large or small tank, excepting that in a large tank with the liquid striking violently against one wall of the tank it would vibrate it or cause it to weave rather violently in that region where it strikes, while in the small tanks the curvature of the small tank would be so much greater by reason of that great curvature with the same thickness of material you would not get so much vibration.

[fol. 341] The weaving of a large volume of liquid would produce more force than a small one. If the volume of fluid in the tank were greater and would weave it would exert more force and power than if the volume were small.

At first I did not understand you to mean the body of the oil in the tank. I thought you meant the walls of the tank itself. Your effort on the walls of the tank, a moving body of liquid inside is proportional to the weight of that liquid divided into—strike that out please—having taken into consideration the area over which the force is applied, if you have a tank of ten feet by twenty feet and a tank twenty feet by forty feet, in measuring the tank 10x20 half

full, it would not contain any way near as much liquid as the tank 20x40 and the effort on the tank from the vibration of that liquid moving at a given speed would exert an effort there proportional to its weight multiplied by its velocity. And the strain would be greater in proportion to the size of the tank, the amount in it and the velocity of the liquid coming in.

An underground tank in cold weather would be relatively warm as compared to the liquid on the outside put into it, and in extreme cold weather a tank buried three feet under ground and having a capacity of approximately 10,000 gallons, were filled with gasoline that had been exposed in a tank car outside the effect would be to cool the tank with the attendant contraction, and that would have a tendency to weaken the tank at its joints, but I don't consider that that contraction would be enough to make the seams break. It would make the metal contract as soon as it had cooled it off and in proportion to the temperature, and it is just as true of a tank underground as above. A tank overground would not necessarily be approximately as cold as the liquid introduced into it on a cold day. There would not be as much contraction in the filling of an over ground tank in cold weather as there would be in an underground tank, because your proportion of contraction is directly proportioned to your change in temperature.

There probably would be a greater strain in the joints of an underground tank on a cold winter day than there would if it were above ground. I saw a fire of a gasoline plant at Eastland, Texas, but I never saw a gasoline tank of more than 50 gallons boil over. The Cosden tank referred to in my testimony was steel. All that I know of were. They had a steel covering on wood.

Redirect examination:

[fol. 342] I didn't take all of my education in continuous years. I went to the University of Kansas five years. I begun my attendance in the fall of 1904. I attended that fall and the following spring, the fall of 1905 and the following spring, the fall of 1907 and the spring of 1908, the fall of 1908 and the spring of 1909, the fall of 1911 and spring of 1912. The reason for the interims is an embar-

rassing question. I did not have the money to go to school for long at a time, I had to stay out and work. None of the petroleum experiences that I have detailed began in the intervals, but some of the others did.

I do not profess to be a chemist. There is a way to get a correct check on liquids in storage by taking the change of temperature and computing the measurements of the liquids in the tank. The changes are worked out. That is the changes of temperature and the effect they would have on a volume of liquid. Here is the way I would go about measuring a quantity of liquid in a tank; the quantity without respect to its temperature is obtained by measuring the contents of the tank. A measuring table is made for every tank and whenever he measures the tank he can find opposite his feet and inches the number of gallons within the tank. The different divisions are ⅛ of an inch apart on all of the measuring sticks that I have seen.

I don't know which is cheaper, the welded or riveted tanks. I have bought lots of them, but I can't go back into the history of these things out of my memory and say what I had to pay for this or that thing, but the most expensive tank I ever purchased was a riveted tank.

Recross-examination:

The poorest tank we put in so much time getting it into usable condition that it finally had to be welded. After we welded it it stopped the leak.

H. A. Lewis, being recalled by the plaintiff, testified in rebuttal as follows:

(Trans. of Ev., Vol. 3, pp. 616-620)

Q. Mr. Lewis, you gave the number of these storage tanks that your company maintained above ground the other day, now I would be glad if you would state to the Master the number of fires that your company has had in all of these storage stations during the last five years?

[fol. 343] Mr. Bennett: To which we object as not proper rebuttal, incompetent, irrelevant and immaterial and not within the issues of this case and constituting no ground for equitable relief.

The Master: Overruled.

Mr. Bennett: Exception.

A. 66.

Q. How many were caused by lightning?

A. Four.

Q. And were any caused by static?

A. Two.

Q. And in how many of them did the fire spread from the property of the company to the property of others?

Mr. Bennett: We want it understood that our objection goes to each of the questions.

The Master: Very well, that is the understanding.

A. One is all I can think of at this time.

Q. And in how many of them was there a rupture or explosion of the storage tank?

A. One.

Q. That is at Hays, isn't it?

A. Yes.

Q. And is that the one you refer to as having spread from your property to the property of others?

A. Yes, sir.

Q. Mr. Lewis, do you know of any way by which the contents of a storage tank with the capacity of approximately 18,000 gallons can accurately be ascertained?

A. You mean exactly? No, I do not. It will vary according to the individual doing the measuring.

Q. And do you know of any measuring stick upon which the gasoline will not crawl?

A. No, sir.

Q. Have you or your company ever been able to find a preparation which could be put upon a stick upon which it will not crawl?

A. No, sir.

Cross-examination:

I am not familiar with the method of measuring by a ook. They sometimes use a steel pipe. I never heard of commercial stick which had a hook or something corsponding to that on the bottom which is used to show ere the top of the liquid is but I would not say that there e not any such sticks. I suppose it would have the same fect as the pipe arrangement, and bring it right to a ser degree, and the ability to measure the contents of the nks accurately would be depended upon the human elent. If a man desired to he could measure it to a nice gree exactly and he could with a hook better than with neasuring stick. As to whether in a tank of ten or twelve ol. 344] thousand gallons you could measure the amount the gasoline and determine the amount at the largest int would depend upon the dimensions of the tank. We ve a table but I don't know without that. If it is a fact t one hundred twenty gallons is what is contained in an h at the largest point in these tanks, the contents of the k could perhaps be measured within five or ten gallons. e have various sticks which vary according to the size of tank, some an inch, some half inch, a quarter inch and ne one-eighth inch.

Q. Now did I understand you to say that your company d no storage of 10000 gallon tanks that large buried——

Mr. Evans: We object as not proper cross examination. idn't ask him about that——

The Master: Sustained.

Mr. Bennett: Our theory was he testified how many fires y have had and I wanted to see what kind of tanks.

Mr. Evans: He testified as regards the number of tanks d the number of fires.

Q. You have told us how many fires your company had d, how many were in underground tanks?

Mr. Evans: We object as not proper cross examination.

The Master: Overruled.

A. None.

We have no underground tanks of a capacity of ten or twelve thousand gallons that I know of and it is not a fact that herein Kansas City we have had filling station tanks of that capacity, ten thousand gallons.

Redirect examination:

We maintain 997 over ground storage tanks in Kansas and the other companies maintain at bulk storage stations, 2388.

Redirect examination:

These fire figures which I have given relate to the business of the company throughout the United States.

Redirect examination:

The number of storage tanks in the territory in which these fires occurred is 12201.

[fol. 345] Alex Henderson, called as a witness by the defendants testified as follows:

(Trans. of Ev., Vol. 3, pp. 620-627)

My name is Alex Henderson. I am now and for eight years have been the Chief of the Fire Department of Kansas City, Missouri. I have been a fire fighter for fifty years. I have fought lots of fires in and about places where oil and gasoline has been stored. My opinion of the tanks underground and over ground is that the one on the top of the ground is the most dangerous because an explosion of gas if the tank is under the ground the weakest spot of the tank is on the top. If there is an explosion there the top would go in and then the liquid would burn from the tank and it is almost the end of the fire because you can surround one of those fires with streams and chemicals and other things and put the fire out but if the explosion happens in a tank above ground it blows all over. It sets everything afire as far as it reaches and you cannot handle it with a stream. Below the ground if the gasoline tank

is blowed up you can surround it with streams of water or chemicals and put the fire out but you can't hit the gas with a stream of water and put it out. That stirs it up and makes it burn worse. You have to put a blanket on it, a blanket of fosmite or water, anything to keep the oxygen out of the air above the fire. We had a refinery down at the Blue River that blew up three different times. The last time it blew it burned seven men dead. Burned some of them that were away from this tank three hundred feet. The tank blew up and just made a sheet of fire. We have a gasoline row in Kansas City, thirteen fillings stations in two blocks, and we have had a great many fires along there. The autos get on fire and from other reasons but we have never had any tanks blow up. We have had all of these tanks on the books but I did not look at the books. I have seen them and in my judgment they are about five thousand gallons and are about eleven or twelve feet and about five feet in diameter. We never had a tank blow up at a station. My experience and the experience of the Kansas City Fire Department with filling stations—we have lots of fires that are caused from some reason that we don't just exactly know what and automobiles have been on fire and the tank on fire and the auto tanks on fire but we have never had any explosions.

Q. What in your judgment would happen if those tanks were above ground and the pumps caught fire?

Mr. Evans: I object to that as an improper hypothetical question and not the subject for testimony by this witness. [fol. 346] The Master: Sustained.

I have had experience with tank wagons blowing up. I think in the history of the tank wagons as much as half a dozen anyhow have blown up. The conditions there was the gas run down the gutter and everywhere and set everything on fire before we could control it. I am a member of the National Fire Protective Association and go to all of their conventions. It has to do with fire fighting and fire hazard.

Cross-examination:

If a building caught fire above a buried tank the fumes underneath would keep burning until it was smothered out.

My experience is that the fumes explode but gasoline won't explode. If gasoline leaked from a large tank and found its way into the cellar of a large room or building and the building caught on fire and the fumes raised up in the room and became mixed with air so as to create an explosive mixture, there would be an explosion. There have been lots of explosions but we don't go to the outside of the city. I do not know of any explosion which has occurred in Kansas City of any large storage tanks, and I have been connected with the fire department in Kansas City for fifty years. I knew of a single explosion to a large tank down at this large refinery, down on the Blue bottoms. Have had three different fires there. That is not in the city limits. I do not know anything about them only in the city limits. I have had some experience with explosions of gasoline tanks and trucks, but I would not by reason of that fact suggest that automobiles or trucks ought to be buried. They carry their tanks in as safe a place as they can and they blow up lots of them and burn. These automobile tanks do not have vents but let the fumes escape. If you had any vents in your auto tanks and they were stored in your garage, why your garage would be filled with gas fumes which would raise from them. It is the fumes from the gas that makes the explosion and not the gas. You can take a quart of gas and spread it around this room and close it up tight and you have a good many cubic feet of gas in the air and that will cause an explosion. The refinery where the fire was that I referred to was the Interstate Refinery. I do not know whether that came from a storage tank or a still. I think it was a still tank. This tank was about four or five feet in diameter and fifteen feet long. When it blew up it went through a storage tank. I know that this high pressure tank of my own knowledge blew and went through a storage tank three hundred feet from it and bounced out [fol. 347] of the ground where it hit and the gas burned seven people up. That was a pressure still tank and not a storage tank.

Redirect examination:

Gasoline was in that storage tank. My testimony is based upon my experience and not from an engineering standpoint.

NATHAN G. BURGSTER, being called as a witness for the defendant, testified as follows:

(Trans. of Ev., Vol. 3, pp. 628-655)

I reside in Chicago, Illinois and am Superintendent of Schedules of the Western Actuarial Bureau. My work consists principally in the formation of fire rate schedules and a study of relative fire hazards and the revision, maintenance and upkeep of schedules which are published by the Western Actuarial Bureau. The various rating organizations in about twenty states, including Kansas, use our schedules. We publish them for the rating of various fire hazards in use in the state of Kansas. I recognize the schedule marked Defendant's Exhibit G. It is for oil distributing stations. There is a definition in the scale that I cannot improve on of oil distributing stations: "Applying to tank wagon distributing stations or combined tank wagon distributing and automobile filling stations, but not applying to any risk at which any manufacturing or processing is done, such as mixing or compounding of oils or greases or dehydrating oils by heating in kettles. Not applying to an automobile filling station unless in a building occupied also as a part of a tank wagon distributing station." That schedule was intended to apply to ordinary bulk storage stations such as you will find all over the country. I had the largest hand in the preparation of that schedule and am responsible for it.

Q. What are the rates on storage tanks, comparing above and below ground storage?

Mr. Evans: We wish to object to——

Q. It is merely preliminary. Well, now I note in the schedule under Item 2 the following statement: "If tank is entirely covered with at least 18 inches of earth reduce final rate one-half (whether tank is detached or forms part of a group)".

A. 18 inches that is. I understood you to say 8.

[fol. 348] Q. Will you tell us the reason for that credit for underground storage?

A. It is because we believe the underground storage——

Mr. Doran: We object to this question as calling for the conclusion and speculation of the witness in this evidence, and as wholly improper to prove any issue in this case.

Mr. Evans: And it is asking the witness to state why the bureau of organization of which he is a member did certain things. We want an opportunity to cross-examine that bureau.

The Master: Sustained.

Mr. Bennett: Here is the man that made the schedule and he is probably the best man in the world to testify why he did it.

Mr. Evans: We are not objecting to this man giving his opinion as to the relative hazard of above and below ground storage.

The Master: Gentlemen, the question was sustained.

In order to get a base for the making of these scales or schedules we use what knowledge we have of the subject under discussion and gather what we can from other people qualified to tell us. Those are the people in the insurance business and in the industry for which we are forming the schedule. We think that the above ground storage of gasoline is more hazardous than under ground because an underground tank is not subject to heating by the burning of an exposing building to any very great extent. It is practically immune from the exposure of a burning building. An above ground tank is subject to leakage and there is a draw off line which is filled with liquid under pressure from the liquid in the tank and the liquid may possibly spread and be ignited. With an underground tank the liquid must usually be pumped out and I do not think leaks are as much of a hazard in an underground tank. I believe an underground tank is considerably more safe from lightning than the above ground tank. It could be struck by lightning. The accumulation of static electricity on raised objects is not present in an underground tank to any extent. In making up the insurance rate for any given property the thing that we consider is the chance for fire occurring and the high rate as compared with the low rates would indicate that, greater fire hazard or perhaps greater dam- [fol. 349] ageability, being susceptible to damage by fire or the result of fire.

Q. Mr. Burgster, referring to a map which the stenographer has marked Plaintiff's Exhibit J, calling your attention to the block designated on that map as Block 71, assuming that the squares shown in red are oil tanks of the Sinclair Company and that the yellow squares are oil tanks of the Derby Company, the orange squares are of the Cities Service and the three broken line squares are the buried tanks of the Fenwick Oil Company, that this building marked "coal" is a coal shed Approximately 70 feet long. This map is drawn to 100 feet to the inch, taking that location as you see it on the map which would you say was the most hazardous to surrounding property, the oil tanks of the Cinclair Company or the buried tanks of the Fenwick Company?

Mr. Evans: We object as incompetent, irrelevant and immaterial, not tending to prove any issue in this case and for the further reasons that the witness has already given his opinion as to that and for the further reason that the question calls for testimony concerning the location of these tanks——

Mr. Doran: And for the comparison of hazards which is a matter upon which the Master has as much right and ability to pass as the witness.

The Master: Overruled.

Mr. Evans: I would like to add this further objection. That the question here contemplates not the relative hazard presented by an underground and above ground tank but it also takes into consideration the character of the work in establishing these plants which is something your Honor knows about. We don't object to him stating his opinion but when he gets to the comparison between Mr. Fenwick's property and the Sinclair Company it takes into consideration elements which no one not familiar with this record could base an opinion on. We haven't asked any one to state whether Mr. Fenwick's tanks are more——

Mr. Bennett: The objection has been——

The Master: Sustained. The witness may give his opinion.

My opinion from a view of the map, Plaintiff's Exhibit J, the buried tanks of Fenwick would be less hazardous than those above ground. I am basing that on the same reasons as given before.

[fol. 350] Q. Basing your opinion on the local conditions shown by the map what would you say?

Mr. Evans: Object for the reason that the opinion has been heretofore given.

The Master: Sustained.

Q. Now going up into Block 40, assuming that the space outlined in red are the Standard tanks and the local conditions are as shown by the map, what do you say as to the relative hazard of those tanks above ground, or buried three feet underground?

Mr. Evans: Same objection.

The Master: Same ruling.

Mr. Evans: Exception.

A. I would say the tanks would be less hazardous underground.

Q. Is this schedule shown as Defendant's Exhibit G, that is the schedule now in effect in the state of Kansas?

A. I couldn't say positively.

Q. Is this the most recent schedule?

A. I think I can tell you by reference to our book of schedules. That is not the most recent schedule but I think that is the one in use in Kansas.

Q. What does the most recent schedule say?

Mr. Evans: We object as incompetent, irrelevant and immaterial. That don't have anything to do with this case, he said it wasn't in use in Kansas.

The Master: Sustained.

Q. Mr. Burgster, does your more recent—what is the date of that?

A. June——

Mr. Evans: Object to it. It is immaterial.

The Master: Sustained.

Cross-examination:

I believe that a storage tank is more hazardous to maintain over ground than under ground. I should think there would be a greater opportunity to oversee or police an above ground tank and if leakage occurred above ground, it would

be stopped quickly and be more readily discovered than would be in the case of a tank under ground. I do not think it would be any easier to ventilate a tank above [fol. 351] ground though, but perhaps a little easier to clean out. That would depend on whether the tanks have a manhole. I do not know whether the distributing station tanks have manholes or not. I think that if in the case described at Marysville storage tanks were burned under the ground and leakage occurred from expansion or a rent and the liquid found its way into a cellar that it would create a fire hazard and I think that if a fire did occur in such circumstances the fumes would rise which would cause an explosive mixture, to which a light being put on or near would cause an explosion. And it might be that if a fire of that kind occurred, it would be dangerous. I have never had any practical experience in the oil business or in the supervising of the building of storage plants for oil. I have had experience in this way that I have inspected and observed tanks on numerous occasions of the kind of those at Marysville and to some extent that observation was carried to the point of observing the manner of operation of tanks from ten to twelve thousand gallons. That is, to a limited extent. The tendency of the rates on above ground storage in these bulk stations during the past few years has been down. As to whether it has come down from about four dollars to one dollar in the past fourteen years I do not know, but there has been a reduction. I cannot say that I do recall that the rate at one time was as high as four dollars. I think the rate at a gasoline tank in a distributing station could easily have been $2.50 or $3.00 some years ago. I think the reason for the rates lessening is that the general opinion on the part of insurance companies is that the rates were higher than necessary and that opinion was based upon actual experience. To a great extent the rates are based upon statistics and experience and judgment of those making them. When a rate is being made on such property I take into consideration also the inherent risk on the storage plant itself and not to the exposure on outside property. The rate referred to is the rate on storage plants themselves. No, there is no difference in the rate on adjacent property or to the distance or exposure on above or below ground storage. May I correct that? I think there

are two propositions you mentioned. The rate of exposed property due to exposure from the tank would be less from an under ground tank but the distance to which the exposure charge is carried would be the same in both cases. The distance varies with the capacity of the tank and contents. Assuming that fifty feet is the limit of exposure the rate on property further away than fifty feet would not be affected. The method of taking contents of an underground [fol. 352] tank out and placing it in tank wagons is by pumping. I think there is a difference in the danger of fire in an underground and above ground storage tank. I do not think there would be more danger if a fire should occur at the time the tank wagon is being filled from the underground tank than from an above ground tank. These above ground storage tanks do not take the highest insurance rate. There are other classes which take higher rates than the majority of above ground tanks. As far as my personal obligation is concerned, I am only familiar with two or three storage tanks of the capacity of ten thousand gallons. I cannot recall where they are located.

Redirect examination:

Q. Now, you said that there are classes of property which take a higher rate than the majority of above ground tanks, what did you mean by that statement?

A. I answered that in a general way.

Q. Explain it, please?

A. If it refers to these distributing storage tanks there are a number higher. There are a number of above ground tanks which rate higher.

Q. Referring to distributing station tanks only?

A. Then I have answered your question.

Q. Now, what will determine that rate on these other classes of property and these distributing stations?

Mr. Evans: I object. He has gone all over that.

Mr. Bennett: My idea was that exposure was the thing that governs in most cases.

Mr. Evans: It is the tank——

Q. You said there would be a difference in the fire hazard with a tank when they were filling a tank wagon in the two classes of storage, what would be the difference?

Mr. Evans: I object because he has already said that the above ground was the more hazardous in that case.
Master: Sustained.

Q. If he had it all right. Now, Mr. Doran asked you a question, if there was a rent in the tank and it soaked into the earth or into a cellar and blew up did you consider the possibilities of that in making up the rate that you published there?
A. Not specifically.
Q. Did you know that such a thing might occur?
[fol. 353] A. Yes.
Q. What do you regard as the possibility or probability of a thing of that kind happening?

Mr. Evans: Oh, I object to that——
Master: Sustained.

Q. Did I understand you that that opinion supposed a leak or rent in the tank to start with and had no reference to the probability of such a rent?
A. The question was so framed.
Q. I believe that is all.

Recross-examination:

The rate on the storage tanks I have mentioned has reference to and is predicated solely upon the risk upon the tank itself, and the rates have no reference to any possibility of a seepage therefrom to some adjacent property. That is not taken into consideration in making a rate on the tank.

Redirect examination:

But in the rate on the adjoining property it is. It includes the possibility of gasoline leakage through the ground. But in case of underground storage that limit is fifty feet.

Recross-examination:

I have heard that underground tanks sometimes floated out and I would think that they would break the connections and spill the contents out and that all this would be dangerous.

Redirect examination:

Q. Now, you said they would break their connections, that is assuming that they had some connections at the bottom of the tank. Do you know the Underwriters specifications for burying tanks?

Mr. Evans: We object as incompetent, irrelevant and immaterial.

The Master: Sustained.

Q. Assume that the tank is buried with the only openings at the top there would be no danger of the connections breaking in that case by floating out?

Mr. Evans: Same objection.

[fol. 354] The Master: Overruled.

A. I think if the tanks were moved appreciably by any force and caused the connection to break there would be a chance of the gas or liquid to escape.

Q. This matter of floating out, could it be guarded against by anchoring?

A. I have read directions for anchoring tanks against that contingency.

Mr. Doran: Object to any such testimony as that.

The Master: Sustained.

Q. Do you have an opinion as to whether the contingency of tanks floating out can be and how it is guarded against?

Mr. Evans: Incompetent, irrelevant and immaterial; he says he never had any practical experience in handling these tanks.

The Master: Sustained.

Recross-examination:

It is true that an underground tank would have to be equipped with the same as above ground and I should think it could hardly be operated without a manhole to get down to the opening where they put the gasoline in. I cannot conceive of the operation of a tank of that sort without means for the ingress and egress of air. It is necessary to have a vent to allow the escape of these gases. Of course if you had such vents as that then if the tank was floated out the

gasoline or other contents would flow out through the vents if the tank turned over.

Redirect examination:

I think these would operate just as effectively in a tank underground as above ground.

The defendants then read in evidence a booklet marked Defendant's Exhibit 7, being a copy of the seventh annual report of the Fire Marshal of Kansas for the year 1919.

J. C. PATRICK, being called as a witness for the defendant, testified as follows:

(Trans. of Ev., Vol. 3, pp. 664-652)

My name is J. C. Patrick. I reside at 2324 Jackson, Kansas City, Missouri. I am a consulting chemist and have been with the Industrial Testing Laboratories of Kansas City, Missouri. I am senior member of that firm. My [fol. 355] training was with the Southwest Medical College of Kansas City, Missouri, from which I graduated seven years ago. I then entered the service of Armour & Company and was with them as Chief Chemist for five years both in this country and in South America. I was consulting chemist for the Cudahy Company and since then for myself. I have had experience with protective coatings for iron and steel to prevent corrosion. In cases involving extreme corrosion of the sub-building or basement and foundation below one of the big packing plants in South America and no adequate means had been provided to protect the metallic part of the structure below the surface when it was built. The result was that in a year's time a pretty bad condition had developed there so serious that the engineers were pretty badly up against it to know what to do and it became necessary to—it was out of the question to re-build. It was necessary to protect the structure as it was only replacing such as necessary and we were pretty successful in arresting any further corrosion. After a good deal of work and consulting literature by others, we found some very interesting records of the work of chromium salts

to prevent the corrosion and we felt we ought to prevent the entrance of water in addition to applying these salts below the surface so the final result was that we used an asphalt cement heavily impregnated with lead chromite. That was placed on the surface by a spray and brush. At the end of two years that surface was absolutely intact. No change of any kind had taken place. This was the plant in Buenos Aires, considerably larger than the Armour plant at Kansas City. That coating would prevent an ordinary three-sixteenths or one-fourth inch steel or iron tank buried three feet under ground containing oil or gasoline from outside corrosion if put on properly. For a surface like that I would say that a spray device would save time over putting it on by hand. I would not put it on a rusty surface, get a clean metallic surface. The coating I had reference to was about one-eighth of an inch thick, and designed to meet the average temperature conditions. That is an easy factor to control. I do not think the average temperature conditions would be different down there. You would not want a hard brittle coating; you might get it cracked and it would come off. It would be practical to put it on soft so it would not come off. I could not answer right off what the solution should be. It protected against a much more serious condition than you have here because there is a good deal more salt there. .05 to .07 per cent of acid is a very low acid per cent and this coating would protect against it. It is an im- [fol. 356] pervious coating and would protect against moisture. In my opinion underground storage would unquestionably represent a safer storage for oil or gasoline than above ground storage on account of the fact that your temperature range over a year's time or shorter period of time would be less. Underground you would have a fairly even temperature. The range would not vary from ten or fifteen degrees Fahrenheit in a year's time. Above ground in this part of the country you have a temperature ranging from a number of degrees below zero to mid-summer where you have the sun shining on the tank and it will not only take on the temperature of the atmosphere but will take up temperature of probably 150 degrees Fahrenheit. In the case of crude oil you would have very extreme volume changes in the gases above the surface, especially during the time of high changes in the summer time and the extreme strain

on the tank which might and will cause leakage in either riveted or welded tanks. That would be more true of gasoline than crude oil. The larger proportion of the highly volatile constituents in the tank, the more it would vary. The danger of being struck by lightning would be immensely increased above ground.

Q. What would you say as to the danger of getting a fire from other structures in the vicinity, communicated fire, what do you say about that?

Mr. Evans: Objected as leading and suggestive.
The Master: Sustained.

There is nothing else that I think of right at the moment bearing upon the relative hazard of the two classes of storage.

Q. What would you say as to whether or not three feet of earth above a tank full of gasoline would be a protection from fire from without the tank?

Mr. Evans: Leading and suggestive, calling for a conclusion. He has already given his opinion as to the relative hazard.
The Master: Sustained.

Q. I believe that is all, by the way, I started a moment ago—do you have any experience with storing gasoline underground?

Mr. Evans: Incompetent, irrelevant and immaterial, he has already gone over that.
The Master: Overruled.

[fol. 357] A. Yes, I had some experience with storing very high test gasoline used in laboratory work which was considered very dangerous, it is casing head gasoline. It was required by the insurance companies that we keep it underground.

The Master: That part as to what is required by the insurance company is stricken out.

Cross-examination:

These steel storage tanks holding from ten to twenty thousand gallons of gasoline and other products of petroleum do sometimes spring leaks. Usually at the weld or where one portion is joined to another. As to whether or not leakage thus caused presents a somewhat troublesome hazard in the handling of these products depends a great deal on where the leakage goes. Under some conditions that leakage presents a hazard and it might present a very serious one. The effect upon the coating of the tank I have described of leakage from within would probably be very little. Leakage from within a tank thus coated would not dissolve the coating very much. It would not help it any and the most serious trouble would be the pressure. And if it penetrated it might cause an opening and dissolve or weaken it. Lightning arresters on the above ground tank would not represent a great deal of protection because the flash of lightning would nevertheless up to the point where it reached the tank be a flash. I would be unwilling to take a chance myself near a tank like that partly filled with gasoline even though it was protected with lightning arresters. I do not know of any way that it could be protected and the risk of lightning minimized to any extent. The lead chromite is supposed to arrest the corroding agency of dissolved oxygen but is not calculated to arrest or destroy any other corroding agent that I know of. That is the main corroding agent. It is practically the corroding agent in the absence of a strong acid. The chromite of lead would be equally valuable in a tank above and below ground.

Redirect examination:

The value of the asphalt is to prevent the entrance of moisture. Asphalt is a member of the group of hydrocarbons and it is very slightly acted on by any chemical. It takes a very strong acid and ordinary conditions have no effect on it. Whether the tank is above or below ground the pressure on the side of the tank and on the bottom would be the same. If the pressure is about one pound the tendency of this asphalt would be to blister out. The asphalt [fol. 358] coating is not in any way to take the place of a

portion of the tank. It is to prevent the presence of the moisture against the side of the tank and the chromite to minimize that already there but it don't represent a chemical acid of any kind.

Mr. Burgster, being recalled for further cross-examination, testified as follows:

(Trans. of Ev., Vol. 3, pp. 653-655)

I say that the insurance schedules for underground tanks are arrived at by a good many others or was settled by asking various people. I do not exactly care to express myself as to whether they were based rather more on lack of experience and lack of knowledge of the hazards involved than from any careful study of actual conditions. That would perhaps make me express a thought that I would not express in that way. There has been no extended study of these conditions since I have been there, that is no study of the schedule that I referred to this morning as affecting underground storage. I will say, however, it might have been studied to a great extent before my time in the office because I did not originate that credit in the schedule. I could not testify as to whether that credit was based on underground storage on lack of experience and knowledge of the hazards rather than a careful study of actual conditions.

Redirect examination:

In view of what I said later on in answering the former question, I am inclined to take back what I said about this rate being based on the consensus of opinion because I have no knowledge of how it was arrived at. It was on before I came into the office. It has appeared in the 1910 edition of the oil tank and still schedule which I believe is the first schedule put out by our office. The credit has always been fifty per cent and sometimes a little more but not now. It seems to be satisfactory to all concerned, the insurance companies and the public.

Mr. CAMPBELL, being called for further cross-examination, testified as follows:

(Trans. of Ev., Vol. 3, pp. 655-660)

Q. Now, Mr. Campbell, I believe you testified that you were familiar with the regulations of the National Board of Fire Underwriters?

A. Yes, to some extent, yes sir.

[fol. 359] Q. I hand you a little booklet which the stenographer has marked Defendants' Exhibit 12 and 13 and ask you to examine them and state if you know what they are?

Mr. Evans: We object as incompetent, irrelevant and immaterial, for the reason that the documents, whatever, they are, show for themselves and being an attempt to get in indirectly that which has been already excluded directly.

The Master: Sustained.

Mr. Bennett: These have never been offered directly.

The Master: I thought they had.

Mr. Evans: Anyhow we object to asking him what it is—it shows itself what it is.

To a certain extent I am familiar with the regulations of the National Board of Underwriters for the installation of oil burning equipment and for the storage and use of oil fuels used in connection therewith.

Q. Is not this a part of that regulation: "So far as storage is concerned each different class of installation introduces a different degree of hazard; the outside underground storage is the safest installation possible and the inside the building storage the most hazardous"?

Mr. Evans: Incompetent, irrelevant and immaterial. Those documents may be used for the purpose of testing a witness' knowledge—he may be asked if he knows whether there are any such regulations but to permit a party to introduce a document of that kind in evidence——

The Master: Sustained.

Mr. Bennett: Our theory of the admissibility of this is this: That this witness on direct qualified himself as a fire insurance expert and actuarian and gave an opinion and for

the purpose of testing his knowledge we have a right to inquire of his knowledge of existing regulations.

Mr. Evans: Ask him if he knows whether there is a regulation by some board and what regulation it may have on some particular subject but this way is an indirect means of introducing——

Mr. Colmery: Do you mean to say that even in these works of medical authorities you can't——

[fol. 360] Mr. Evans: You can ask if certain symptoms are not indicative of a certain disease, for instance.

Mr. Colmery: I can read that and ask him if that is not a regulation——

Mr. Doran: You wouldn't have a right to prove what was in the book. You might ask him if he agreed with so and so but you couldn't prove what is in the book.

Mr. Bennett: Did the Master rule on the objection?

The Master: Yes, I sustained it.

Mr. Bennett: Note our exception.

Q. Doesn't the same regulation of the National Board provide the following:

Mr. Doran: I object to him reading it into the record.

Q. "Storage tanks should be placed underground to obtain the greatest measure of safety. Where this cannot be done and tanks are necessarily located within the building, or above ground, such an arrangement is considered more hazardous."

Mr. Evans: We object for all the reasons given.

The Master: Sustained.

Mr. Evans: And the plaintiffs further move that this question be stricken out of the record as prejudicial.

The Master: That part will be overruled.

Mr. Bennett: Save an exception.

Q. I will ask if the regulation of the National Board of Fire Underwriters for the installation and storage and handling of hazardous liquid is not as follows: "These storage systems, in the largest sizes, are such as are generally found in oil fields, oil refineries or distributing stations and consist of tanks located above ground. The hazards of such systems depend upon the distance from burnable property and topography of the surrounding land, but

owing to the tanks being above ground they are considered as more hazardous than underground systems of storage?"

Mr. Evans: Same objection.
The Master: Sustained.
Mr. Bennett: Exception.

[fol. 361] I arrived at my conclusion that underground storage was more hazardous than above ground storage perhaps some six or seven years ago—about eight years ago when I first started my inspection of refineries. I found a large buried tank in the middle of a refinery and that is my recollection of when it was. It was not after I knew that I was going to be a witness in this lawsuit. I have always had the opinion that the larger tanks at the Cudahy Refinery at Coffeyville—I arrived at the conclusion that the ten thousand gallon tanks were more hazardous perhaps about the time of my knowledge of this trial for the reason that the question had never been brought to my attention before, because I do not believe the question has ever been brought up before. Yes, I would say that I arrived at this conclusion after I was consulted by Mr. Evans because never before had it been brought to my attention—that there was a possibility of that kind of storage before. I knew there was storage in filling stations of very small tanks. I did not change my mind about it after I found that my testimony was desired as much as making up my mind on something that had just been presented to me. My opinion prior to that time was that underground storage was more unsafe basing my opinion on the underground tanks of refineries. I had no opinion on the underground storage at distributing stations because I never thought of that matter.

Redirect examination:

Nobody undertook to influence me in this matter at all. I cannot recall the first occasion of our meeting in this matter except that I was invited to express an opinion as to underground or above ground storage and I think I mentioned this large tank at the Cudahy refinery as being unsafe.

Recross-examination:

I did not in substance during the noon hour state to Mr. Burgster that up to the time that I was consulted about this case either in words or in substance have an opinion that underground storage was the safer. Because of the fact that the schedule contains a fifty per cent credit for underground storage, I may have called that to his attention. I had no opinion about it. We have no approved tanks for underground tanks, storage at these distributing stations, and that would somewhat affect the credit of the fire insurance rates. We have no underground tanks approved by the Fire Underwriters. I have not seen Mr. Fenwick's tanks at Marysville. I would say that if they [fol. 362] are ten thousand gallons that they are not approved unless the records I have are wrong.

Dr. Roy Cross, being called for further cross-examination, testified as follows:

(Trans. of Ev., Vol. 3, pp. 660-668)

I testified that storage of large amounts under ground is more hazardous than above ground but in small tanks it would be safer under ground. In a certain Bulletin No. 15, of the Kansas City Laboratory put out in 1919 copyrighted in the same year by Roy Cross, I made a statement on page 147: "Store gasoline in underground steel tanks. Use wheeled steel tanks with measuring pump and hose. They prevent loss by fire, evaporation and spilling." That is true for small tanks. However, to explain more fully my attitude on the matter I should like to read another part of the same bulletin on page 87. "If tanks could be successfully and cheaply built in the ground they would have the advantage of almost perfect insulation from outheat, and the oil would be stored at practically the temperature at which it comes from. For this submerged type of tank, concrete construction would be proper if capable of perfect construction. It should be monolithic, well reinforced and lined with a coating impervious to water and gasoline." That has always been my opinion, if it is pos-

sible to have perfect construction then underground storage would be better, but a tank as large as ten thousand gallons would be almost sure to develop leaks. It is safer above ground for the reason that the leaks could be repaired and taken care of. They could be found. My reason for the statement "If they could be successfully and cheaply built in the ground they would be safer underground" is that there would be no possibility of leaks. The danger of fire communicated from exterior sources is about the same in either case. I do not say that there is less danger in above ground than below ground storage tanks in the case of a supply station where your warehouse burns down or catches fire and in close proximity to the storage tanks and afer it would fall over against the tanks. In that particular instance it would be safer underground as far as fire is concerned. The statement "out of 503 fires 310 were caused by lightning and 193 by other causes" which occurs on page 68 of the same bulletin, represents statistics that I had collected and I suppose they are correct. I know Dr. George A. Burrell. He is a chemist in business in Pittsburgh, Pennsylvania, and he was at one time with the Bureau of Mines.

[fol. 363] Q. Now, Doctor, if Dr. Burrell in a technical paper 127 of the Bureau of Mines entitled "Hazards in Handling Gasoline" makes this statement "If large quantities of these substances are used, the main supply should be stored in a metal tank buried at least two feet under ground and at least 30 feet from buildings. The working supply should be pumped into the buildings as needed and the system should be so arranged that when the pump is stopped the supply pipes will remain full of the liquid. Where it is not possible to use a pump and a buried tank the main supply should be stored outside and well away from other buildings, under lock and key. Working supplies should be taken into the building in closed metal cans only, of not more than ten gallon capacity, and safety cans should be used whenever possible." What would you say to that?

A. I don't know all the circumstances. I would say as I said before that reasonably small tanks are safer buried underground and larger tanks are safer above ground.

I would say that a tank of one thousand gallons underground should be carefully studied by engineers before putting it in. The danger from fire from gasoline itself increases in proportion to the quantity. I read six or seven years ago, I think, a technical paper 117 of the Bureau of Mines on the quantity of gasoline necessary to produce explosive conditions in sewers.

Q. If in that experiment Dr. Burrell poured into a sewer 8 feet 3 inches wide and 8 feet 6 inches high and 2706 feet long with manholes at from 300 to 400 feet apart along that distance, the velocity of the sewage being 6.45 linear feet per second, the depth of the flow was about 8 inches, the amount of the flow 19.6 cubic feet per second, the grade of the sewer 0.9 per cent, temperature of the water in the sewer 69.8 degrees Fahrenheit, the temperature of the air just above the sewer was 68.5 Fahrenheit, above the ground 68 degrees at 2 P. M. 55 gallons with a specific gravity of 67.5 Baume were rapidly dumped into the sewer at Manhole Number 1, and samples of the air collected from [2::2] P. M. to 4:45 P. M. at ten minute intervals and the maximum quantity of gasoline vapor found in the air was at Manhole Number 2 at 2:13 and the quantity was 2.19 per cent and in all other cases it was less, the nearest approach to that being .89 what would you say as to the probability in the light of that experiment of sufficient gasoline seeping from an underground tank and getting into a sewer in quan- [fol. 364] tities sufficient to cause an explosive mixture?

Mr. Evans: That question is too complicated and long to follow.

Mr. Bennett: The question was, in the light of that experiment, what——.

The Master: You may answer the question if you can do so.

A. The two per cent mixture would explode.

Mr. Evans: I object to the experiment as not being the true conditions found in sewers.

Q. You think that represents the true condition?

A. No, it doesn't.

Q. Oh, and why not?

A. The temperature of the water is lower than that found in the average sewer. The ventilation is better both of which would very materially modify the results.

Q. What would you thing of a test—out of 6553 tests of the air in sewers in the city of Pittsburgh, 6278 showed less than .05 per cent, 205 tests showed between .05 and .1 per cent, 60 tests showed .92 per cent, no, 60 tests showed between .1 and .2 per cent, 6 tests showed between .2 and .4 per cent and 4 tests showed between .4 and .7 per cent, does that represent the conditions of sewers generally?

A. That is what they found.

Q. Those are not explosive mixtures?

A. Seven per cent is.

Q. .4 to .7 mixture?

A. No, that wouldn't.

Q. What are the explosive mixtures?

A. Approximately 1½ to 6 per cent.

Q. Would that experiment, in the light of those experiments would you want to modify your statement about the probability of sewers exploding by seepage of gasoline?

A. No, I think that if gasoline gets into the sewer and there is ignition the possibility of explosion is rather great.

Q. And is the fact of 55 gallons being poured at one time and producing no explosive mixture only at one minute or instant of the time while in there, that wouldn't affect your opinion of gasoline being able to seep in drop by drop enough to cause an explosive mixture?

Mr. Evans: There is nothing in evidence about that 55 gallons being poured in at one time.

[fol. 365] The Master: Overruled, you may answer if you can.

A. No, it wouldn't.

Redirect examination:

Upon having his attention called to this statement on page 9 of the technical paper 117 by Dr. Burrell and Mr. Boyd, "It is evident that one barrel of gasoline poured all at once in a manhole of a fast-flowing sewer renders the air explosive for only a few minutes at any particular point" Dr. Cross stated: "If sufficient gasoline accumulates at

any one point there would be an explosion." And upon having his attention called to this statement found on page 11: "The test shows therefor that 5 gallons of gasoline per minute introduced into the sewer under the conditions described would produce a dangerous condition as long as the flow lasted" Dr. Cross stated: "My opinion is that that much gasoline might produce an explosion."

Q. I invite your attention to page 12 "The results of the test prove that with a sewer submerged by high water extremely dangerous conditions can result from a small amount of gasoline. As will be noted from the analyses, between manhole 5 and manhole 6, a distance of about 500 feet, there was a dangerous condition five hours after the gasoline had been run in. It will also be observed that the percentages of gasoline were slightly but noticeably increasing at manholes 3 and 4 above. It can be readily seen that if, as might happen, a sewer should be submerged for several days or a week at a time highly dangerous conditions would result if as much as 5 gallons of gasoline or line oil were to escape at one point from garages and dry cleaning establishments or other places situated on its drainage basin." What is your opinion as to that?

Those conditions might establish an explosive condition in the sewer.

Lead chromate has been used to prevent corrosion but I do not think it is universally accepted as being satisfactory for that purpose except locally. It is used in direct or plate coating. It offers temporary protection, it might stay the oxydation or corrosion of iron for a short time. It would stop corrosion but when any film is broken and any air got to the iron, the corrosion often becomes worse. This lead chromate would not have any effect one way or the other in the way of stopping a leak. If a leak started from the interior when it came in contact with the asphalt—the asphalt would not arrest the flow. It would carry the [fol. 366] lead chromate away if it dissolved the asphalt. Any asphalt covering would tend to lengthen the time that a leak would start from the outside, but if there were any loosening of rivets or seams, then the asphalt would not be effective at all.

Recross-examination:

It would take a considerable leak for gasoline to leak through the ground and get into a sewer five gallons a minute, but after awhile it would. We ordinarily expect in a large tank underground by expansion and contraction an opening of the seams somewhere and the leak would start and with repeated expansion it would get larger and larger until the depth of the oil in the tank is noticeably different. There would be practically no termination of the leak until that point was reached and that might leak five gallons a minute. Yes, it would be possible for a leak to run three hundred gallons an hour in almost any kind of a soil. Yes, I would expect to find that in a soil which when a cross section of approximately one-half inch of that soil was placed in a funnel, water placed on one side and a vacuum equal to twenty inches of mercury on the other and two and one-half hours of that pressure. In that time only small droplets of water passed through the soil, I would say in that kind of soil it would be possible for gasoline to pass through some three hundred gallons an hour.

Then over the objection of the plaintiffs, the defendants introduced in evidence as a part of Dr. Cross's cross-examination the technical papers 117 and 127.

(Note.—The Clerk will here insert the exhibits just referred to or photographs thereof.)

A. J. Brooks, called as a witness for the plaintiff in rebuttal, testified as follows:

(Trans. of Ev., Vol. 3, pp. 662-682)

I have since this case started visited Marysville and the place on the Union Pacific tracks there where the Sinclair storage tanks are located. I made an examination of these tanks particularly with reference to the condition of the paint.

Q. You may state to the Master what the condition of the paint is?

A. The paint on the tanks of the Sinclair, the two tanks I looked at have the appearance of about nine months to a year—very good condition.

[fol. 367] Mr. Bennett: We object to that and move that the answer be stricken out as not responsive.

The Master: Overruled.

There are no leaks in the tanks. There might be one or two very small places where there would be a little hardening or check in the paint, but I did not observe any places where the paint was so broken that it would lead to corrosion.

Q. Did you observe the condition of the ground around the tanks as to whether or not it was clean of weeds or trash of any kind?

A. Yes, sir.

Q. You may state what you found?

Mr. Bennett: Object as showing a condition which has arisen since the commencement of this action.

Mr. Doran: I will connect it up.

The Master: Overruled.

A. Inside of the fence, and of course I don't know how far your property runs, inside of your fence line and in the immediate vicinity of your fence it was clean.

Q. Any weeds or trash or debris?

A. No, sir.

Direct examination:

I heard the testimony of Mr. Fenwick in this case to the effect that he stood upon the ground near the Standard Oil tanks at Marysville and observed them and that the manholes which Mr. Wagner testified were on these tanks were not there. I was at Marysville last Friday a week ago. The manholes are screw top but not in the way of caps. I took while there some samples of earth. I used the two inch auger similar to what Dr. Cady used and I bored three holes, near at the Standard Oil plant, first right between the two tanks and the next between the two tanks at the Sinclair station and the next ten feet north of the Fenwick station just outside the property line of the sidewalk. I sealed them up in half gallon fruit jars in different depths,

eighteen inches to twelve feet I think to get under the sewer from eighteen inches down, various measurements about two feet apart and delivered them to Mr. Boehmer, Superintendent of the refinery at Sugar Creek. The erecting of storage tanks at the various storage stations of the Standard Oil Company in our territory comes under my supervision.

[fol. 368] Q. You may state how you proceed in erecting these storage tanks, just how you go about it?

Mr. Bennett: We object as having been traversed and not rebuttal and an attempt to prove custom, not binding on the defendants.

Q. It is in the nature of rebuttal?

The Master: Overruled.

Mr. Bennett: Exception.

The witness then proceeded as follows:

Of course there are various tanks. We are using the standard tank now. First the tanks came in on freight cars generally from our refinery at Whiting. We manufacture our own tanks, riveted tanks. They came to us provided with all the necessary manholes and inside check valves. In fact they are ready to mount on the piers when they reach us. In handling them we get them off the cars as carefully as we can. We proceed then to mount them on piers with the aid generally of railroad ties and large jacks. We then hook up our pipe lines and pumps, get the line in good shape ready to receive the stock which is generally ordered about the same time as the tank. Then we test the tanks generally with water by pumping it through them. We do that to see if we have damaged the tank. I never put up a tank that I can recall in which we did not have some leaks—bound to have them. After we get the tanks in the ultimate location and make the tests we have a boilermaker get on them. Then when we find that the tanks are in good condition we wait two or three or four weeks for the general exposure on the metal and then paint them.

Q. Do you know of any way by which the tanks can be handled from the factory to the ultimate location and there established without breaking—making them leak?

Mr. Bennett: We object as an attempt to prove a negative.

Q. Is there any way known to you by which these tanks can be shipped from the point where they are made and established in their ultimate location without making a leak?

Mr. Bennett: Same objection.
The Master: Overruled.
[fol. 369] Mr. Bennett: Exception.

A. No, sir. I don't believe that a tank ten feet in diameter with the weight of the shell——

Mr. Bennett: Now, we object to this as voluntary.
The Master: You may go on and answer.

A. I don't believe it possible to get them on the piers without straining the seams and getting some leaks.

Q. Do you know of any way by which tanks of this kind and size can be accurately measured?

Mr. Bennett: Same objection, an attempt to prove a negative.
The Master: He may answer.
Mr. Bennett: Exception.

A. No, I will say it can't be done in my opinion.

Q. Now, Mr. Brooks, I would like to have you give a description in order that it may be in the record of this defendant's Exhibit 9—pipe.

Mr. Bennett: The pipe speaks for itself.
Mr. Evans: It doesn't show what material it is made of.
The Master: Go ahead and describe it.

Defendants' Exhibit 9 is just an ordinary black pipe which is used in the construction around tanks. The condition of it is just about what you find around an ordinary station. The condition of the pipe indicates that it has been in service at the place where corrosion sets in and eats up the pipe, but this has been submerged in oil so that—that wouldn't last much longer. It has started. That is, the honeycombing or corrosion of that pipe has started; that is an indication that it would be honeycombed within a short time. After corrosion sets in it increases.

This pipe Exhibit 9 might have continued to function for several years in oil. It would last three years, possibly not that long. I state that from the corrosion I observe on the pipe itself. I did not say that all that pipe had been submerged in oil. Only a part of it. About to this point here (indicating) the other portion has been above ground and the corrosion was worse above ground than below. I was present when the tanks of the Standard Oil Company [fol. 370] at Greenleaf, Kansas, were on fire. When I got there from what they told me the fire had been on about five and one-half or six hours. The warehouse had burned completely down and *and* the tanks were burning, that is, the oil under one end of the gas tank. There was a very big fire there and the McDonald vent was throwing off large volumes of flame and smoke and the large safety valve, that was working at intervals. Well, it is hard to tell how much but it would show that when the McDonald valve could not take care of the pressure inside, was not sufficient to carry off the pressure then the big valve would respond, that is it would come in action. That large valve is closed until the pressure in the tank gets up to the point where it raises it up, and then we would get a very large volume of smoke and a short duration of flame, not much. That carried on most of the night and the reason we could not get at that is that the platform on the inside of the warehouse where the lubricating oil was stored, some forty or fifty barrels, that was nearest to the tank and that saturated the cinders. The ground was covered with cinders and they were burning and were very hot and the contents of the gasoline tank were boiling. The manhole shield there, that weather shield was off and in the morning about ten o'clock we could get to it and see what was creating the fire. The outside two inch valve was melted off and the inside check valve failed to seat properly. It is a valve with a long stem that goes through the tank and a rope goes in and ties down. Now in case of a fire that rope will burn off and the valve will seat and keep the contents of the tank from running out; but that valve had not seated properly and let some gasoline out and kept the fire burning. About eight o'clock in the morning our salesman in that territory got up on top of the tank and hit the valve and shut it off and about an hour after that the blaze went out. The tanks are there in use now, the same identical

tanks except the valves on the outside. The tanks were burned pretty bad, corrugated on top, but they did not leak. The big valve is generally in most cases located in the center of the tank but in some cases we find that the ring or portion riveted on the tank is at one end and we then fit the safety valve in it there. It would function on either end or the center but if we put them on a new tank we put them in the center. By the big valve I mean the safety manhole cover. There is a rise of about six inches in this manhole vent. It is the most important valve on the storage tank. It works up and down and that piece of iron that you see across there about six inches long that works on the eccentric and that comes down and we tie it with a piece [fols. 371 & 372] of rope and in case of fire the rope will come off and seat the valve. That is the most important valve we have. Then the next valve, you can just see the stem of it. That is a rising stem there. We do not rely on this one here. This is a kerosene tank in the picture. The wind was blowing on the end of the tank. I can show you very plain here. What kept our fire going was that valve melting off and it was burning there just like in a still. The McDonald duplex valve is a safety valve on the top of the tank but not on the manhole. It is located down about three feet from the end. The only valve in the manhole is a weight. That weight sets right down a flange. The safety manhole valve that I speak of is similar to Plaintiff's Exhibit F. There is a big flange riveted on the top of the tank. That is twenty-four inches. On that there are four teeth to the inch that would screw down in and then a wall comes up about six inches. That receives that tin top. When the contents of the tank become so that the McDonald duplex valve cannot take care of the escaping gas, then this manhole weight will raise up like that and then go back to the seat again and your duplex will take care of it again for awhile. There is nothing in the manhole vent to burn off and no motion to it, nothing at all, nothing to get out of shape. It works like that all of the time. It does not want to be confused with the valve because there is no valve about it. The McDonald duplex valve on top of the tank is always in action. The rising stem valve on the outside of the tank is to let the fluid out and then there is one inside

of the tank too, two valves. The safety devices consist of the McDonald duplex which is a two inch opening and then this manhole which is eighteen inches on the rise or clearance, twenty-four inches over all. Both of the safety devices worked at the Greenleaf fire, both the manhole and the McDonald. The trouble was that a valve melted off. If it had not done that we would have had no trouble. That valve, however, has nothing to do with the venting. Plaintiff's Exhibits I, J, K, L, M and N fairly represent the fire at Greenleaf concerning which I have testified. They were taken about nine o'clock on Friday morning. Exhibit Q fairly represents the location of the various tanks and warehouse at Greenleaf plant just before the fire.

The plaintiff then introduced in evidence Exhibit Q, as follows:

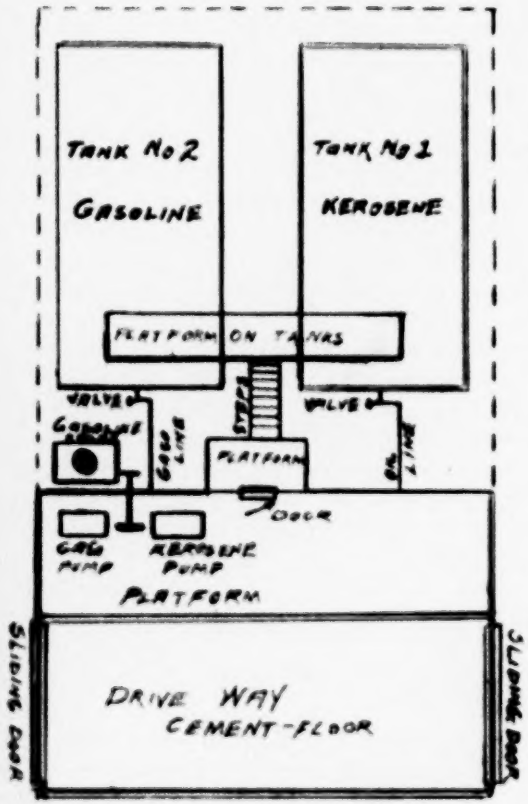
(Here follows Exhibit Q, marked side folio pages 373 and 374)

[fol. 375] Cross-examination:

I do not think I saw a sweat on the tanks of the Sinclair when I saw them. I just went around them and did not look carefully. There might be a discoloration on the north side. That happens very often unless you absolutely remove that before you paint. They start from a leak. There never was a tank built that did not have some leaks sometimes early in its history. I do not say that these tanks were clean of weeds last summer or the summer before last. I heard the witness testify where that piece of pipe came from but I do not know myself. I know where the light company's tanks are. I did not ever notice a pipe line there. If that pipe were buried in Block Forty under ordinary conditions it would not last two years. I could not. It is all cinders there. I heard the witness testify that it was completely covered with cinders but that it was completely submerged in oil. It had to be. About half way down the pipe from the top has never been under the ground. Normally I would say that that pipe set about like that (indicating), that puts your acid cuts on that end. That is caused by cinders. I heard him testify that it was buried in 1912 but you are not going to

PLAINTIFFS EXHIBIT Q 373-374

BULK STATION
GREENLEAF KAS



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submerge your tank in oil. That oil would be fifteen feet deep. I testified that that is common black pipe and I think it is the least resistant to corrosion of all pipes. We do sometimes paint it with parolite. I doubt very much whether black pipe is less resistant to corrosion than galvanized pipe. Galvanized is more protection. If you galvanize black pipe it would help it some. I got some cinders in the samples of earth I took there. I got the Greenleaf fire about seven-thirty in the afternoon. It was too hot to do very much. We did not put a wet blanket over it because we did not have any blanket. I do not believe I would have gone up there if I had a carload of blankets. It was the outside rising gate stem that melted off. That did not relieve the pressure but would allow the contents to go out. The pressure was so violent in there that nothing could have relieved it in the way of a small valve. A two inch opening would not do it. It was yelling like a man [man] for assistance, whistling. There was a very stiff wind blowing from the warehouse towards the tanks coming from the north and going to the south. It was an ordinary western Kansas wind. It carried this smoke and flame quite a little ways. I would have no way of telling how far. You know how black smoke would be. I heard Mr. Armstrong testify that it would carry this flame at times when it belched out as far as one hundred feet and [fol. 376] he told you the gasoline run out seventy-five or eighty feet. The prairie was burned about one hundred feet. I want to say that the gasoline did not run down the hill, it would catch fire and burn first.

F. L. King, a witness called for the plaintiff, testified as follows:

(Trans. of Ev., Vol. 3, pp. 683-684)

My name is F. L. King. I reside at Chicago, Illinois, and am Auditor of the Sales Department of Standard Oil Company.

Q. Did you have occasion to observe the effect of fire upon storage tanks of the Standard Oil Company in Cloquett, Illinois in 1917?

Mr. Bennett: To which we object as the circumstances are not shown to be the same as the circumstances at Marysville.

The Master: Overruled.

A. In the fall of 1918, in the fall of the year they were fighting forest fires in the Duluth district, the entire town of Cloquett had been wiped out by the forest fire and two Standard oil storage tanks were in the town. And they were left undamaged. This happened to be fortunate insofar as the town was concerned. Temporary quarters were built by the Red Cross and we furnished kerosene to the people.

Cross-examination:

Our tanks were in town. The saw mill was across the river. That was all that was left. The nearest building to those tanks at that time was about twenty-five feet. That was a feed store of frame construction. I judged that by the timbers and embers left there. The wind shifted all ways during the time. There were no other storage tanks in town that I remember. Our tanks were, I think, about twelve thousand. That was six or seven years ago.

Mr. Brooks, recalled for further cross-examination, testified as follows:

(Trans. of Ev., Vol. 3, pp. 683-684)

I regard the manhole cover in use by the Standard as the best possible equipment, and I do not think anything else than that would be a proper safeguard. That has been determined by a half century of constructive work for safety devices to install in our tanks and we have them. Anything that would relieve the pressure would function [fol. 377] and be all right. It would not necessarily have to be that kind of a manhole. I do — think the goose neck would be sufficient. There has been too much trouble with that. They will not do the business. A wasp will build a nest in there and your gooseneck is gone.

Redirect examination:

I noticed that there was a manhole top on the Sinclair tanks. I could not tell from where I stood just what they were.

Mr. Griffin, recalled by the plaintiff in rebuttal, testified as follows:

(Trans. of Ev., Vol. 3, pp. 684-687)

I am familiar with the kind of tanks used in the filling stations in Kansas City. Nearly all of them are what we call twenty barrel tanks, approximately ten thousand gallons. I do not know of any tanks at the filling stations of the company of as large as five thousand gallons in Kansas City. We measure the contents of the tank having a capacity of approximately ten thousand gallons through this McDonald vent. We insert a long measuring rod which reaches to the bottom of the tank and we determine as near as possible where the gasoline is in the tank by looking at the stick. It is not accurate regardless of how carefully we make the tests. I do not know of any preparation that gasoline will not crawl on, I wish we did. We experiment with that almost daily. It is difficult to measure the contents of a tank by inserting a stick because each inch is slightly more or less than the preceding inch. In the center of the tank which is the largest area one-sixteenth of an inch makes quite a difference. We get an approximate measure of the stock we have in the tanks. You might determine what should be there by counting the amount put in and deducting the amount take out but what actually there would be different because there are so many irregularities in the handling of the stock. Someone may have drawn out some and not made a record of it. Then a little is spilled but that is not a very big factor. We cannot compute accurately the amount of evaporation by any means I know of.

Cross-examination:

We have some evaporation in filling station tanks where they are buried. It is a little hard to answer accurately

as to whether it is like it is in the above ground tanks. I do not know about the temperatures. I am not an expert but I do not think the large body of storage heats up so [fol. 378] rapidly but it is more rapid above than below ground. There would be narrower range three feet under ground and you would not get the evaporation at lower temperatures that you would get at the high ones. I cannot answer what the dimensions of particular tanks are. Some of our tanks are ten in diameter by twenty-nine feet, six inches, 355 barrels or 17600 gallons approximately. I could not tell without looking at the tables what a difference of one-sixteenth of an inch on the stick at the largest point of any particular tank would amount to and I have no table with me. I have not measured tanks lately but I did several years ago. You could not see a hook very well in those tanks if placed on a stick. We do not take measurements from manhole. The only objection to that, however, is not that it is more trouble. If the manhole was open in the center of the tank you would have a large area open and would have a hard time keeping the stick in the right direction. We might help that some but we would not want to interfere with the manhole. If we did put a stick in at the manhole it would be very difficult to determine where the point entered the gasoline.

William F. Parli, a witness called by the plaintiffs in rebuttal, testified as follows:

(Tr. of Testimony, pp. 687-698)

Direct examination.

By Mr. Doran:

"Q. I will ask you to take the drawing that I now hand you which the reporter has marked Plaintiff's Exhibit P. (should be R.) and explain to the Master by as simple a statement as you can the character of the manholes on the Sinclair tanks at Marysville, Kansas, and use the Exhibit R. to demonstrate the statements you make?

"A. This is a fair cross cut view of the manhole, cross cut section, and the location of the McDonald vent by the side of the manhole cover. This lid—sits in a——

"Q. The lid of the manhole?

"A. Yes, sits in a gasket riveted on the top of the tank. This lid is loose, can be lifted clear out.

"Q. Sits in it——

"A. Sits down in there a little, just a good deal like the cover on a pail but a little part goes down on the inside.

"Q. Indicate the part where it goes down in?

"A. The part of the lid sits down in the gasket and the other part extends over the gasket.

"Q. Isn't this in the drawing the vent part which sets down into the——

[fols. 379 & 380] "A. That is correct.

"Q. Now, then, that is a lid with a cover which fits down through a sort of an extension into a cast iron shell, that is bolted on the top of the tank, is that right?

"A. Yes, the lid is all one piece.

"Q. But it fits down into a cast iron circle that fits on top of the tank?

"A. To some extent, not as much as it shows——

"Q. How big is the manhole?

"A. 18 inches.

"Q. In diameter?

"A. Yes.

"Q. Tell how that moves, is it fastened down in any way?

"A. No, sir.

"Q. Under pressure from the bottom will it move up?

"A. Yes, it will.

"Q. How much does it weigh?

"A. I would say between ten and twelve pounds."

The tall stem with a large cap at the left hand side of the picture is a two inch pipe with a McDonald vent in it.

"Q. Is one of these on each tank in addition to the manhole?

"A. Yes."

Exhibit R is here offered and introduced in evidence as part of the testimony of Mr. Parli.

The clerk will here insert copy or photograph of Exhibit R.

(Here follows Exhibit R, marked side folio pages 381 and 382)

Cross-examination:

By Mr. Bennett:

"Q. The lid sits over the top of the manhole loose?
"A. Yes, absolutely."

[fol. 383] Mr. Boehmer, being called as a witness for the plaintiff in rebuttal, testified as follows:

(Trans. of Ev., Vol. 3, pp. 689-712)

Q. Mr. Boehmer, when you were on the stand the other day you produced a sample of gasoline and made certain experiments in a test tube for the purpose of showing that the gasoline vapors were heavier than air and in the course of your cross-examination you were asked to make certain other experiments with that same gasoline. Now, I will ask you if you are prepared this morning to make that certain other experiment that you were then called upon to make on your cross-examination but make it with the kind of gasoline known as Red Crown gasoline, which is commercially used?

A. Yes, this is regular Red Crown gasoline that I got at our service station at 8th and Minnesota about fifteen minutes ago. I have tried this experiment myself and have not been able to get enough heat under it to make it boil over with matches but I have in the laboratory by putting it in a gas fire and by using a very hot gas fire I could make it boil over. The gasoline which I had here the other day was a special solvent gasoline that we have in the laboratory and had an end boiling point of not over 250 degrees F. It will burn down in the tube if the production of vapor is not rapid enough, but it is not burning with explosive violence and if there was a screen over the tube it would not—not—in holding this tube with a match under it I was not able to get it to boil.

PLAINTIFFS EXHIBIT B 381-382

Mr. Bennett: It is burning down in the tube.

A. Right at the surface of the tube, possibly down a little bit there. Now I was able to make it boil over with a gas fire but I can't get it to boil anywhere with a match. The temperature around this now is about 200 degrees Fahrenheit. It will boil over if you get a hot enough fire.

Q. Explain, Mr. Boehmer, the other differences, if any, in this experiment and the one that you made the other day?

A. Well, in the first place the product which I had had a very low boiling point which would mean that we would produce in the bottom of the tube almost a single bubble which would lift the whole thing out. Now, I used a tube like that there in the laboratory and by using gas heat I was able to boil out ten per cent of the product in the tube in one minute and the elevation was not over 1/10 of the depth of the liquid. I timed it with a watch and measured it.

Q. In what way from a cubic standpoint does the experiment that you made here compare with the strain that would be put upon a 17,000 gallon storage tank with fire around it?

[fol. 384] A. That is an extremely rapid rate of distillation, such a rate couldn't be brought around a storage tank, you couldn't get it to boil out at the rate of ten per cent a minute, you couldn't get enough heat.

Q. You can in the test tube?

A. If you will calculate roughly the amount of combustible burned in that flame under this test tube with the fact that we have a long cylindrical column of oil you will find to get the same amount of heat we would have to have a very high temperature way beyond the explosive point of gasoline. In the laboratory when we were boiling materials in containers which approximately are the same as our storage tanks we do not have any shooting out but when you have a small diameter with the heat applied at the bottom the conditions are different.

Q. It is more active than it would be in a horizontal storage tank?

A. In a horizontal storage tank your bubbles would be distributed over the tank.

Q. And the fluid content would not be so likely to boil over?

A. No, even with this tube we were able to boil off ten per cent in a minute, that indicates that you can get such a high point of evaporation without boiling over and if you had conditions like in our storage tanks the conditions would be less.

Q. Much less likely to boil over?

A. Yes, the action in this tube is in my mind no measure of what will happen in a container that has a different ratio of diameter and length. We couldn't produce enough heat—and your only purpose of producing it was to show that the gasoline vapor was heavier than air and that a flame at the top would not go down and form combustible vapor——

A. Or explosive mixture.

Q. Now, you and several other witnesses have referred to the end point. I wish you would just go ahead and tell what end point is and the relation is has to the gasoline.

A. Well, our fundamental analysis of gasoline is a distillation test and in performing that test we take just about that much gasoline and place it in a glass container and distill it at a specified uniform rate. Technically when the fourth drop of distilled vapor is off—we collect the vapors, run them through a coil—when the fourth drop has left the end of this condenser that is the initial boiling point. Then proceeding on through the distillation the highest temperature attained by the thermometer in the vapor space in the flask is the end point, so the initial or actual [fol. 385] boiling point and the end point are shown by that test.

Q. So when Mr. Fenwick testified that the end point was the point at which it vaporized he had the wrong end?

A. Yes, the end point is the highest temperature attained during the distillation of galosine and initial point is when the evaporation——

Q. What is the product commonly known as crude oil?

A. It is a product occurring in the earth which is the source for these various petroleum products.

Q. And it varies in its volatility in accordance with the various fields from which it is produced, doesn't it?

A. Yes.

Q. Will you kindly name some other inflammable and combustible liquids other than the ones that we have men-

tioned which have been as I recall gasoline, kerosene, fuel oil, crude oil and distillate?

A. The only other petroleum products that I can recall right now covers a group known as naphtha, which are used in cleaning establishments and paint manufacture. Outside of petroleum products are turpentines and rosin oil, which are used in paint and alcohol, both pure and denatured, which are used in various ways and then there are heavier oils which do not flash at atmospheric temperature but are still inflammable when heated up, such as linseed oil——

Mr. Bennett: What is the purpose of this?

[Q.] To show what the various things are that we are dealing in.

Dr. Cady went into all these things?

Mr. Bennett: I don't recall that he did.

Q. Do you think of any others?

A. A numer of vegetable and animal oils that are used in paint work and various industries that are inflammable when heated up, just as inflammable as lubricating oil.

Q. Mr. Boehmer, will you explain to the Master what cast iron is and the difference between cast iron and the kind of metal that storage tanks are made of?

A. Cast iron is normally the product from a blast furnace and is the poorest grade of iron that is manufactured from the point of view of strength and uniform quality. On account of its method of manufacture it always contains the maximum amount of carbon which iron can contain and [fol. 386] that gives it the brittle nature. Then when various manufacturing processes are going through to remove or control the amount of carbon and also to introduce possibly some other metals and remove possibly some sulphur we get into the steels and the steels have much greater strength than cast iron, they are able to be worked, and that is bent, and——

Q. What is galvanized iron?

A. Really steel which has had the surface thoroughly cleansed and dipped in liquid [ainz].

Q. Will you explain the practicability of using cast iron and galvanized iron for storage tanks of the capacity of approximately 17,000 gallons?

A. Taking up cast iron first, cast iron is an excellent corrosion register but the trouble is that it is very brittle, tends to be porous and has no great tensile strength. In order to construct a tank of the capacity you refer to, which would probably be about ten feet in diameter by thirty feet long, I don't believe it could be cast as a unit. If it could be cast as a unit it would be very susceptible to internal strain, strains within the metal due to different kinds of cast iron being in the same casting, which would be very much subject to cracking or even breaking. Cast iron cannot be made in sheets and then rolled to a certain radius and then riveted. You can't bend it, so the only possibility would be to have it cast in sections and then bolt these sections together with gaskets between fixed flanges. You can't rivet cast iron because the rivets when they cool will break it. So a cast iron tank would be prohibitive.

Q. What do you mean?

A. I don't believe anybody could make it. Except from the one standpoint of bolting sections together and in that case you would have the gasket joints. We used to have in the refinery, not the Standard, a steam pipe with a flanged pipe and the gaskets were a constant source of trouble.

Q. What kind of trouble?

A. The gaskets would either blow or rot out and then they will leak.

Q. What about galvanized iron for a similar use?

A. These tanks could be constructed, in my mind, out of no less than ¼ inch steel and I do not know of any plant at this time in position to galvanize such heavy metal.

Q. What is the process of galvanization?

A. After the sheets are rolled to their standard thickness they are cleaned in a vat of acid and they pass right out of there down into another vat filled with molten zinc and they come out of that bath and are chilled and have thereby acquired a coating of zinc. I don't believe it would [fol. 387] be possible to galvanize the sheets as heavy as need [need]. But even if you could, if you build a riveted tank, punching or drilling the holes for the rivets and also riveting would destroy the galvanized surface around the rivets and if you weld the tank you would vaporize the zinc in the neighborhood of the weld so you would leave your

steel exposed in either case. Galvanized on big sheets is also subject to be scraped off in handling. In case your tank could be constructed that way you would destroy some of the galvanizing by carrying the tank on a truck car and getting it in position.

Q. Will you explain what the process of welding is?

A. We operate—they weld according to two plans, one they use an oxy-acetylene torch and the other they use a low voltage, high current electric welding. In either case the sheets which are to be welded together are either butted together and then welded on both sides or they may be lapped and the edges of each sheet welded down. Some industries welded equipment by butting the sheets together and passing extremely high current through the sheets in the neighborhood of the joint and that produces such a high temperature that the sheets are perfectly melted and they are welded but that is not used except in a few cases.

Q. What is the cost of welding as compared to the cost of riveting tanks?

A. I can't quote exact figures but about three weeks ago we made comparative estimates on some 10 x 30 tanks which we wished to construct for our use for lubricating oil purposes and the welded tank would cost about $850.00 and the—per tank whereas we are paying $1,140.00 for riveted steel tanks.

Q. Then welding is about twenty-five per cent cheaper than riveting.

A. According to those figures it is. That is our experience in the past when we secured comparative costs.

Q. At any rate welding is the cheaper of the two?

A. Yes.

Q. Then if it is the cheaper why is it not employed in the building of these tanks?

Mr. Bennett: That is out of the line of rebuttal.

Mr. Evans: Your Simpson says it is the only way to make tanks. He says they are much superior and we want to——

The Master: You may proceed.

[fol. 388] A. We have never been in favor of welded tanks for the reason that we do not know the factor of safety of the joints.

A. There is no way of knowing how strong the joint is. Whenever we build any steel equipment we first determine what pressure we wish to use in that and then on the basis of engineering data we say, we will build our tanks to hold three or four times as much as that, then after we determine that we proceed in the process, determine the thickness of the metal that we need and type of seams, the size and number of rivets and the design of the head. When we get welded tanks if the welding is done perfectly the tank is as strong on the welded joints as at any other place but the only way to know that is to break it with your pressure and see which breaks first——

Q. Have you ever had any experience in examining welded seams?

A. We have discarded about two years ago twenty pressure stills on account of the fact that they were developing leaks which we were not expecting. We cut several sections out of these stills, including the welded joints in each case and bent them through the welded joint and I can recall two samples which looked fine on the outside but which were poor joints. Thirty per cent of the metal is all that was joined and there was an actual gap between the two sheets. On account of that we discontinued the use of those.

Q. Do you know the current wage that is paid to a welder?

A. I think in the neighborhood of 80 cents an hour.

Q. You referred to pressure stills a moment ago, there has been some evidence here of the explosion of a pressure still down in the Blue Valley. I wish you would explain to the Master the relative pressure that is on a pressure still and on a storage tank of the kind that we have described here?

A. The pressure stills that we operate at our plant are operating under the Burton patents and during the operating period the oil within the still is under a pressure of about 97 pounds. The stills referred to in the testimony yesterday were at the Interstate plant which is not using the Burton patent and I do not know what pressure they operate under but they are under a cracking unit higher than atmospheric pressure.

Q. Would they have more pressure on them than the storage tank of the kind we have described?

A. Yes, they would. The pressure in the storage tank is nothing more or less than a head pressure because the McDonald vent would operate on an ounce or two of pressure so the pressure at the top cannot be over the ounce or two [fol. 389] above atmospheric pressure but the pressure at the bottom is the head of oil in the tank.

Q. And the pressure in a still would of necessity be several times greater than the pressure in a storage tank?

A. Yes, a great deal higher.

Q. Did Mr. Brooks give you certain samples of soil?

A. Yes. He delivered thirteen samples to me.

Q. Now, I want to make this short. Will you state whether or not you made any experiments with these soils for the purpose of ascertaining whether or not gasoline would go through them?

A. Yes.

Q. Did you find find whether or not gasoline would go through them?

A. We found gasoline would penetrate through each sample.

Q. Much has been said here about the breathing of tanks, will you kindly state what that is?

A. Breathing primarily is the inhaling or exhaling—I will start over again—Gasoline storage tanks whether they are in sales department or refinery service have a vapor space above the liquid. During the daytime when the temperature is rising the vapor will expand and, of course, the excess vapor will breathe out. At night when the temperature falls the vapor will contract and the deficiency is made up from the outside air. That is fundamentally what breathing is.

Q. What, if any, means do you employ to look after this breathing?

A. Breathing will bring about an appreciable loss for large tankage and for that reason, during the past two years, have been making all our gasoline storages with tight roofs. The old practice was just to put a roof on and take it—allow it to leak or hold the vapor just as it best could, or it sometimes leaked water. At the present time we make them as tight as possible and then we construct a line through which this breathing can take effect and the latest development which is in the experimental

stage now, is to put a balloon on the end of the line so any vapors which are breathed out will be returned the next day. It is a measure of saving gasoline vapor.

Q. Mr. Boehmer, what is the comparison in size of the vents that you have heard described here on the storage tanks and the vents that you have on the tanks that you store gasoline and kerosene in at the refinery?

A. Our storage tanks, which run, with the exception of two small tanks, which—they hold from two to three million gallons apiece, they have eight inch vents, one eight inch vent to a tank.

[fol. 390] Q. As compared to this 18 inch vent?

A. Yes, with the 18 inch vent with a four inch rise.

Q. Mr. Simpson stated that a barometric change might produce a suction sufficient to cause an outside flame to go against the pressure coming from within the tank through this manhole which pressure would have to be sufficient to raise this manhole cover, which weighs approximately twenty pounds, what is your opinion upon that subject?

Mr. Bennett: We object as not proper rebuttal. And not the way to impeach testimony. And we further object to it because that isn't what he stated.

Q. It is exactly what he stated. I will put it another way, however. Have you an opinion as to whether or not a barometric change would be sufficient to cause a suction in a tank sufficient to enable an outside flame to be introduced into the interior of a storage tank through a manhole having a cover that weighs approximately twenty pounds against the pressure necessary to raise that manhole?

A. Yes.

Q. State what that opinion is?

A. If you have an internal pressure sufficient to raise the manhole you must have an internal pressure approximately .4 of a pound greater than the pressure on the outside of the tank in order to open the manhole. If you should have a barometric pressure change the maximum change that one could conceive of would almost have to be a cyclone around, would be a change of two inches of mercury. Assuming that such a condition did occur and the atmospheric pressure increased it would shut the manhole because if you

have .4 of a pound on the inside of the tank tending to raise the cover and then raised the outside pressure two inches of mercury, something that doesn't happen, it would tend to press the cover back down. But I don't think the flame would go down. The cover would drop back——

Mr. Bennett: We object because the witness didn't say that.

Q. He said the manhole would drop back down. Then the flame from without couldn't be introduced into the tank?

A. If there is a pressure on the outside rushing to shut the lid the flame won't jump back.

Q. Have you an opinion as to whether or not that water applied in any other way to the outside of such a storage tank would cause it to cool fast enough to create a suction within the tank sufficient to permit an outside flame to be introduced into the tank through the manhole that I have [fol. 391] referred to and against the pressure necessary to lift that manhole?

A. Conditions would be the same with that as with a barometer rising. You will cause a cooling of the vapor in the tank and a subsequent contraction below the pressure necessary to raise the manhole. As soon as the pressure inside the tank is below the pressure necessary to raise the manhole the manhole is shut and no flame could get back.

Q. And the flame couldn't proceed against the pressure from within the tank?

A. No, sir.

Q. Several witnesses for the defense have referred to parolite, a product, as they claimed, which could be applied to the outside of buried tanks for the purpose of preventing corrosion, what is it?

A. We make it either from crude residium or from the residue which we get from our pressure stills and from a mixture of the two.

Q. It is a Standard Oil product?

A. It is a product which we make.

Q. You may state whether or not it is a conductor or non-conductor of lightning or electricity?

A. It is quite a good insulator. While parolite itself is not, a substance a good deal like it is used in storage bat-

teries and electrical equipment of that nature as an insulator.

Q. Suppose a storage tank buried in the ground were coated with parolite so perfectly that there were no openings and the vent from the pipe extending above ground were struck by lightning, what would be the effect on the tank?

A. If the tank and vent under ground were coated with parolite you would have an insulated tank.

Q. What would be the effect if it was struck by lightning?

Mr. Bennett: He has testified he don't know a thing about lightning.

Q. You may state what in your opinion would happen?

Mr. Bennett: We object as no proper foundation has been laid.

The Master: He may state if he knows.

A. I know that when a body is insulated from the ground and struck by lightning it is always torn up with more or less violence and I would assume that a tank insulated from the ground would act in the same manner because it is insulated from the ground and you would have to have a severe electrical discharge to break this insulation.

[fol. 392] Q. This would act as an insulator on the tank and——

A. Prevent its being grounded.

Q. And is that also true of this other asphaltum preparation to which Mr. Patrick referred?

A. I don't think the introduction of lead chromate would have anything to do with it. It would be in suspension and material in suspension does not affect the electrical conductivity.

Q. So the situation would be the same with the preparation referred to as with parolite?

A. Yes.

Q. What is this lead chromate?

A. It is a yellowish salt used fundamentally for paint pigment, producing yellow paints.

Q. And what value, chemical value, has it as an arrester of corrosion, in your opinion?

A. Personally I had not heard of the affair until Dr. Patrick testified to it. I had never heard of it as being used

to resist corrosion but his explanation of producing the condition he describes just leads to the doubt of whether he can maintain the iron in the positive state. Ordinary iron, as we know it, will dissolve in most acids but iron has a peculiar nature in that it can be converted to the positive state. The usual way is to dip it in a certain strength of nitric acid. After it is dipped in the nitric acid and taken out and washed out it will not dissolve and it is then said to be in the positive or inactive state. There isn't much known about that but the trouble is that that positive condition can be destroyed.

Q. How?

A. One method is to warm the iron up and certain chemicals will destroy the positive state, so assuming you could maintain a good coating of the stuff over there——

Q. What would be the effect of a leak from the inside from which gasoline would be injected?

A. Any gasoline which would get in contact with the parolite, it would dissolve the lead chromate and there the iron would be free to corrode.

Q. Then if the tank thus coated would spring a leak from the inside it would weaken the corrosion resistant qualities of that?

A. Yes, sir. The instance referred to by Dr. Patrick is the first I have ever heard of or even reported in technical literature.

Q. Are there other corrosion agents than the acids of the earth that might come in contact with pipe or tanks buried?

A. In addition to the acids there are certain alkalines which would affect iron slowly and oxygen dissolved in water or saturated with water vapor will corrode iron.

[fol. 393] Q. What is the operation or change known as local action. Isn't that it?

A. That is more or less of a combined chemical and electrical action.

Q. Isn't that a sort of an electrolysis?

A. Especially with steel which has not only iron and carbon but usually some sulphur, some magnesium and [silicum] always and sometimes other substances combined with it, you will have conditions in the metal not of uniform composition and if you have salts or acids and sometimes alkalines in the neighborhood of where you have such kind of

iron, you will set up a little magnetic cell. The principle is exactly the same as the old fashioned copper and zinc battery and you will get a pulling at that point which is nothing more or less than the solution of the iron around this spot where you have a dissimilar mixture.

Q. That is wholly independent of electrolysis produced by direct currents of electricity in the earth?

A. That is nothing more nor less than a very minute electrical battery and it is a factor, especially in simpler metals. Impure zinc will corrode very rapidly in certain solutions whereas you put chemicallly pure zinc in the same solution and nothing will happen and iron is susceptible to that action because of the other metals in it.

Q. That is your corrosive influence in the metal in the ground?

A. Yes, if you should have salts or acids present around ones of these points you would set up a small cell.

Q. And does rain water ever produce anything of that kind?

A. Rain water will contain not only dissolved oxygen but also frequently contains acids washed out of the air, known as organic and also carbonic acid. Carbonic acid is the thing that causes us the greatest amount of trouble about our refineries because the Missouri River water is very rich in acids.

Q. Might the rain water produce a corrosive influence independent of the acids shown in a chemical test of the soil?

A. Yes, sir.

Q. Have you an opinion as to whether or not the grounding equipment of storage tanks with lightning arresters lessens the danger of loss from lightning?

Mr. Bennett: We object as no proper foundation having been laid, the witness testified he don't know anything about the lightning.

The Master: Answer.

[fol. 394] Mr. Bennett: Exception.

A. My conclusion is taken from the fact that the equipment of buildings and other outdoor equipment with the lightning rods produces satisfactory results and I believe the same condition would apply to storage. I have never seen a tank when it was struck and the grounding device

operating but I draw my conclusion from the old fashioned lightning rods.

Q. Is there any difference in the lightning loss on large storage tanks with steel and wooden tops?

A. The steel top tank the loss is very much lower than with wooden roofs.

Q. One witness said it would run as high as sixty per cent, the loss from lightning, that would apply to wooden roof tanks?

A. I know that crude tanks with wooden tops are ignited every little while but I don't know of any with steel tops and I know that many companies that are handling large quantities of crude are putting on steel roofs.

Q. Would the seam of a tank part from fire or heat as long as there is wet gasoline against it?

A. If the seam is submerged the inner side is under a liquid and there is not a coating of scale the seam will not open up.

Q. Then the seam of a tank will not open below the surface of the liquid inside?

A. No, it will not.

Q. Is there, in your opinion, any difference in the hazard producing qualities of new and old cinders?

A. I believe that—you refer to old cinders as cinders that have been in the wet for some time. I believe that it is possible to eventually detract the acid from the cinders in—after a time they would have a smaller amount of acid in them whereas fresh cinders will be very rich in acid content.

Cross-examination:

I have not heard any statement made that gasoline ran out through seams. The seams in a still do not open. They are subjected to a fire by forced draft, a regular blast. Cases of ruptured stills are very rare. Chief Henderson in his testimony was referring to the Interstate. The fire was due to the fact that the men who were handling the stills did not know what they had and their stills *was* below our standard of safety. It went off across the country and we could see the fire from our plant. They used parolite for roofing pitches and right now for mixing with asphalt. We

[fol. 395] do not make it at Sugar Creek but we used to make it at Whiting. Some people are trying it out to coat lines to try and resist corrosion but we have given it up and I do not know that we are selling it for that purpose. That is not the purpose for which it is developed. I cannot conceive of any condition in which a flame could pass into a tank with that manhole vent open. I do not think that lightning will wiggle around. The tanks are grounded. That is my understanding. I believe that the grounds are sufficient protection from a B-flash of lightning. The wire is the size of a lead pencil. It might and might not protect the tank against B-flash. I do not know much about lightning. These balloons that we have mentioned are not used at storage plants but at the refineries. My testimony is mostly based on refinery conditions, and the balloon is to relieve the gas which is considerable when you have a storage of several million gallons. The same proportions probably exist in smaller quantities but in the Sales Department the stuff moves rapidly and we have to hold it. When you have a storage of several million gallons the evaporation amounts to something. The breathing mentioned is the factor that these balloons are after. The temperature brings about the breathing which is less at low temperatures. If we could get the temperature down, it would effect a saving in the industry in these large tanks. It is probably not worth the trouble in small storage but there is a loss there just the same. The pressure of these welded stills that fail is about 97 pounds. I think the highest that anybody could conceive in an ordinary tank is about one pound. The vent will take care of most of that. The average is about one pound. The stills which we have constructed were constructed for resisting a very high pressure, much higher than these tanks and our stills for heavy pressure are heavy, heavy seams are riveted, whereas we build our small tanks with lighter rivets. A weld that would not hold one pound pressure could not be detected with the naked eye. As a rule the welded metal generally breaks, depends upon the type of weld and upon the efficiency of the welder. It may break either the weld or the metal. You can make a lot of welds which are fine to the naked eye but when you put them on a tension test or bending test it may fail quickly. I do not

think that a wooden ladder would interpose any hazard to lightning if placed on the tank. Impure water is a conductor, chemically pure water would not be. Air itself is a better conductor than a wooden ladder. The wooden roofs were taken off of storage tanks because they cannot be made tight and a large number of crude fires seem to be due to the [fol. 396] fact that the difference of leaking vapors from the roof makes difference. We had a serious fire at Casper, where two or three men could see the vapors burning above the tank before it caught fire. If you had a tank painted with parolite and it was struck by lightning as the parolite is a non-conductor of lightning could not get out. It will build up a charge sufficiently high to become dangerous due to the resistance of that parolite coating and you would have a discharge. Any other kind of a non-conductor which would completely insulate the tank from the ground would cause the same thing to happen. Wet concrete is somewhat of an inductor. An insulator prevents the discharge from a positively charged body to a negatively charged body until you develop enough potential to jump the gap. These are not referred to as insulators. They are referred to as non-conductors of electricity, and in the case you refer to of two tanks side by side the spark could not be generated unless one tank was charged positively and the other negatively and the charges sufficiently high to jump the gap between them, and in the case you refer to they jump the wood handle or the air gap. I do not know that all of these companies that manufacture lightning arresters in reference to the protection of oil tanks lay down the specifications that you shall not ground your tanks or have any wooden ladders around. I do not know of a company at Des Moines that equips more tanks to protect against lightning or what they say about it.

Redirect examination:

The sump referred to in Dr. Cady's testimony would just introduce two more joints to keep tight. It consists of a collar and a joint which has to be maintained. If it is made for the purpose of draining something away from the tank, it would also drain the gasoline with it.

Recross-examination:

The matter of getting water out of the tank is not as important as cleaning it. It is not any great thing to get the water out of an underground tank. It is just as easy as one above ground. I see no objection to the laying of drain tile on top of the ground to drain surface water off.

Recross-examination:

Bakelite is acid resistant and is also a good dielectric and I do not think can be made in pliable form. It is a very good insulator but extremely expensive. I do not know much about Duco. It is a product put out by the Dupont [fols. 397 & 398] people. I cannot answer as to whether it is acid resisting or not. The only claim I hear for it is the harder you rub it the better the polish.

Mr. Wagner, called in rebuttal by the plaintiff, testified as follows:

(Trans. of Ev., Vol. 3, pp. 712-717)

I have the blue prints here that we used in constructing the lightning arresters referred to. Referring to Plaintiff's Exhibit S, our bulk stations equipped with grounding devices made up of the following materials: The rails at the side track are grounded with a U iron made up of seven rolled wires which are welded to the rails. The rail is connected with the pump house gasoline engine, storage tanks, unloading stands, pipe lines and warehouses with No. 6 solid copper wire, eight pounds to the one hundred feet. Referring to Exhibit T it shows in detail the method of installing the grounding device to the side track, pump house, storage tanks, unloading system, pipe lines and warehouses.

Cross-examination:

All of our stations are practically the same. There are small differences. The only difference is that this little pump house is attached to the warehouse here. This is the

PLAINTIFFS EXHIBIT S

7' 4/0 GAS WELD
RAIL BOND

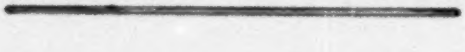
1/4" TOBIN BRONZE WELDING ROD

BRAZING FLUX
1 LB CAN

BAR SOLDER
50% LEAD 50% TIN

WIRE SOLDER
50% LEAD 50% TIN

SOLDERING PASTE
1/2 LB CAN

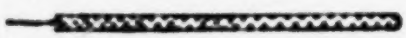


#6 ANNEALED BARE SOLID COPPER WIRE 8 LBS PER 100 FT

#0 ANNEALED BARE 7 STRAND COPPER CABLE 32 LBS PER 100 FT

#3 PARAGON GROUND

3/8" - 3" GROUND CLAMP



#14 SINGLE CONDUCTOR DURALORD

2" AWNING PULLEY

TRUCK LOADING CONTACT HANDLE

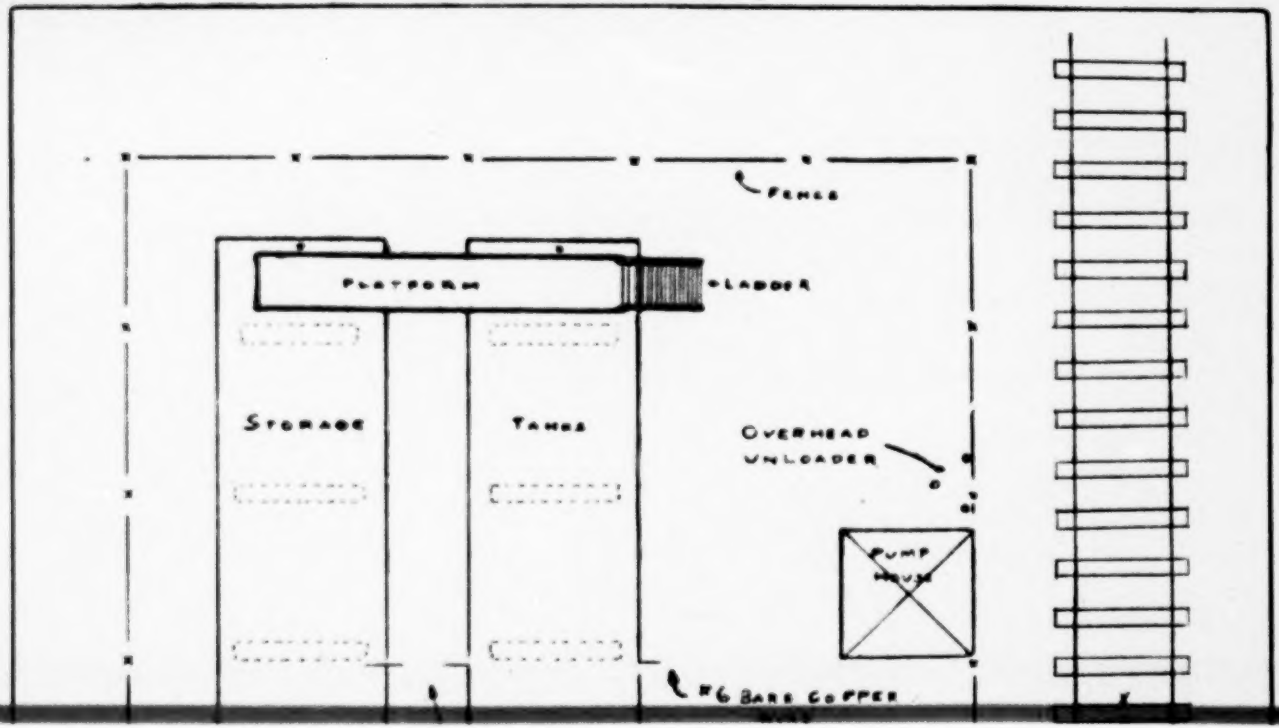
TANK TRUCK STATIC CONTACT BALL

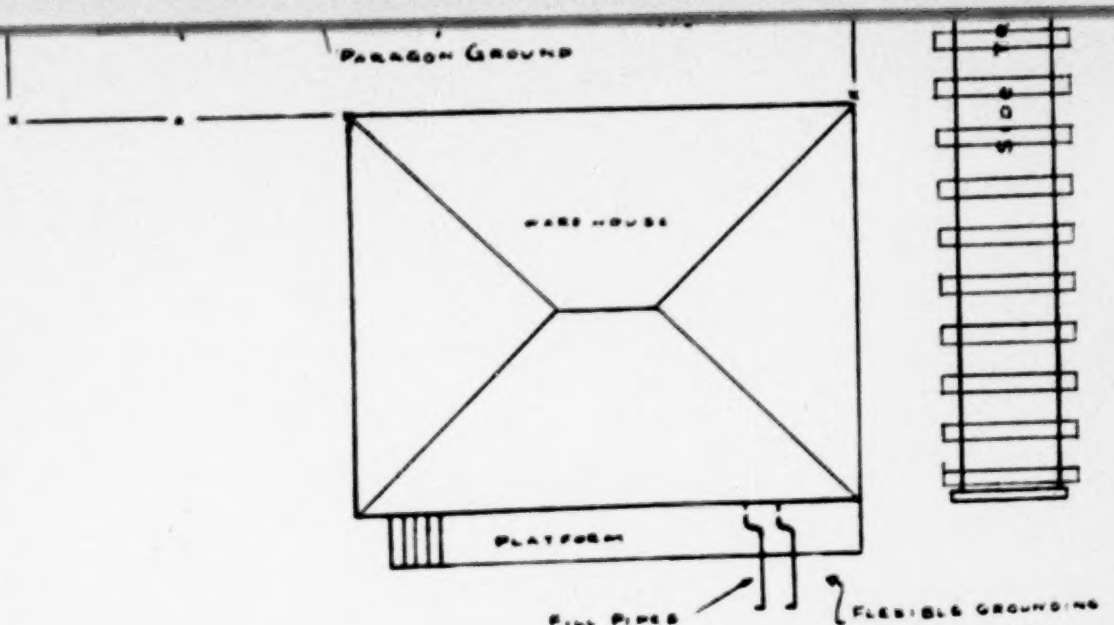
STANDARD OIL COMPANY INDIANA SAFETY DEPARTMENT	
MATERIALS USED FOR GROUNDING AND BONDING BULK STATIONS	
SCALE NO SCALE DATE JUNE 28 1929 DR T.W.B. TR T.W.B.	DRAWING NUMBER 113

376

399-400

PLAINTIFFS EXHIBIT T





AT B STATIONS OF VOLTAGE TEST TAKEN BETWEEN RAILS AT THE SIDE TRACK AND UNLOADING PIPES SHOWS LESS THAN ½ VOLT. NO BONDING WILL BE DONE ON THE TRACK. IF TEST SHOWS OVER ½ VOLT. RAILS MUST BE BONDED TO THE UNLOADER AND INSULATING RAIL JOINTS INSTALLED AT THE CLEARANCE POINTS OF THE SIDING BY THE RAILROAD COMPANY SEE DRAWING # 105 FOR DETAILS

FOR DETAILS OF INSTALLATION OF WIRES AND PARAGON GROUNDS AT TANKS SEE DRAWING # 103.

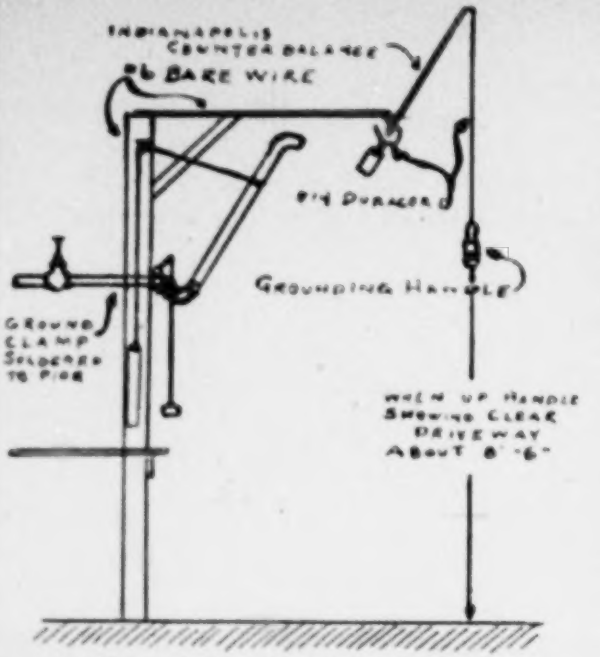
FOR DETAILS OF INSTALLATION OF FLEXIBLE CONNECTION TO TANK TRUCKS SEE DRAWING # 112

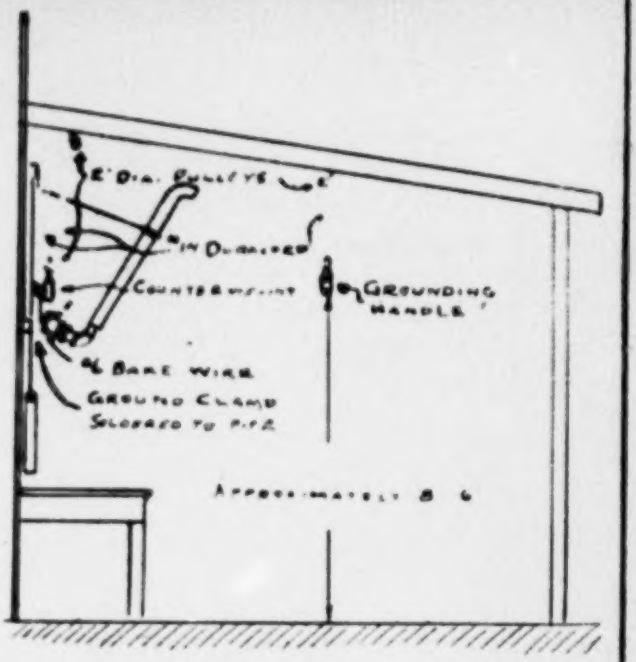
STANDARD OIL COMPANY INDIANA SAFETY DEPARTMENT	
TYPICAL GROUNDING LAYOUT FOR "B" STATIONS	
SCALE NO SCALE DATE MAY 16 1924 DR T W B TR T W B	DRAWING NUMBER 111

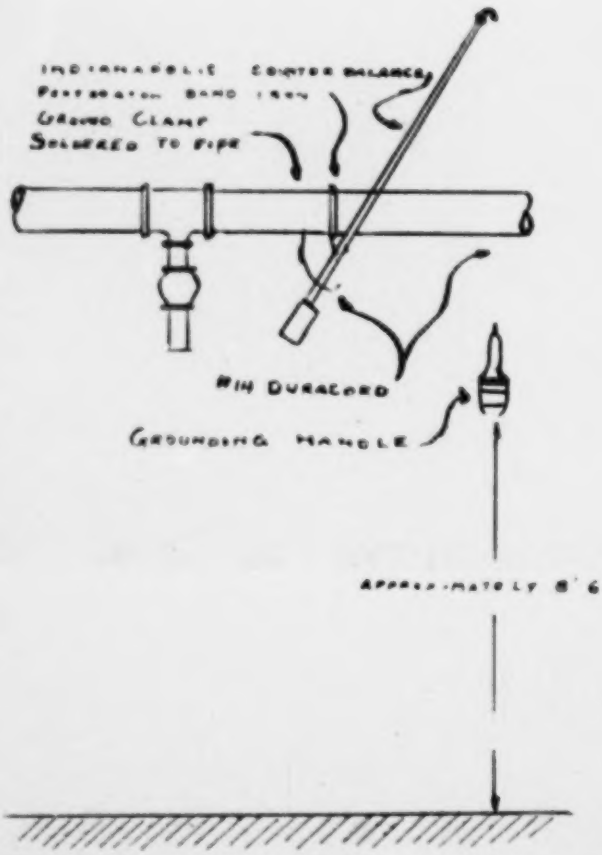
401-402

377

PLAINTIFFS EXHIBIT W





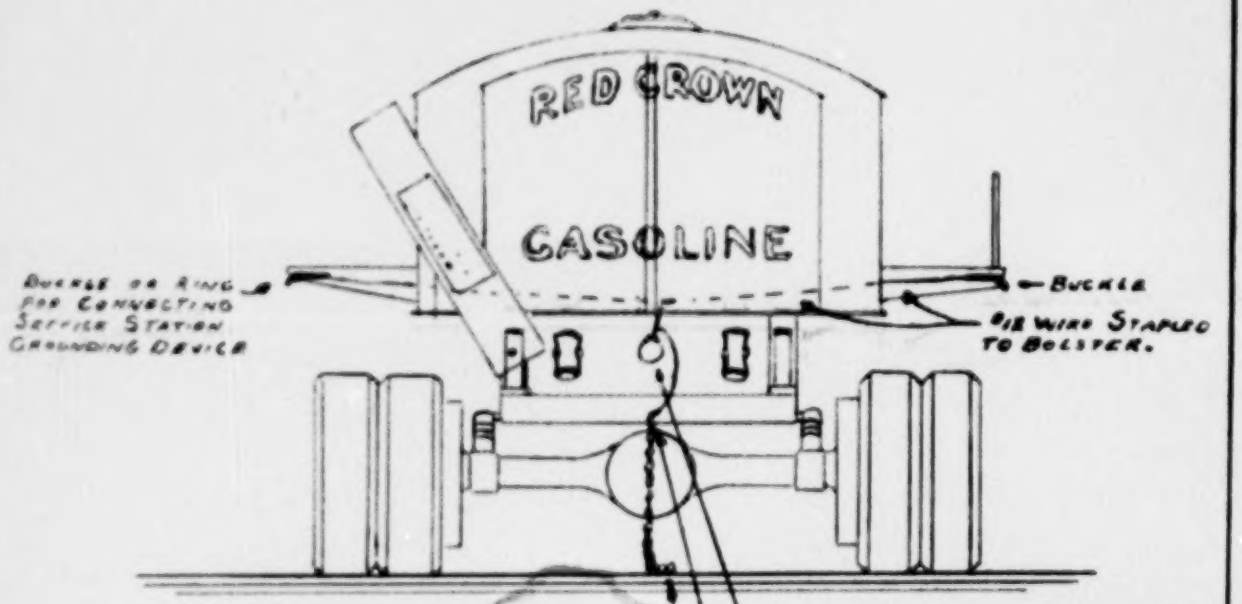


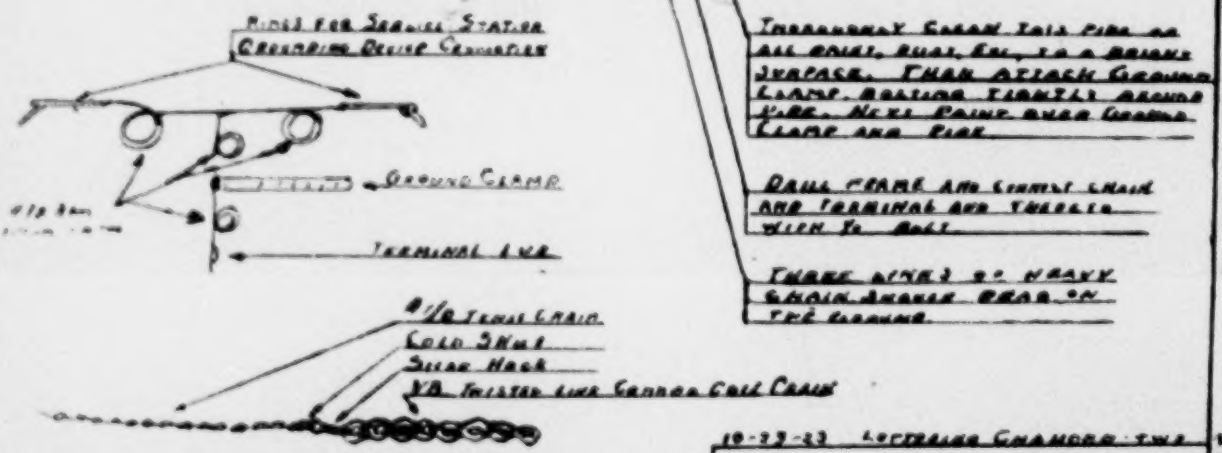
STANDARD OIL COMPANY
INDIANA
SAFETY DEPARTMENT
METHODS OF INSTALLING

4037

PLAINTIFFS EXHIBIT V

GROUNDING CHAIN INSTALLED ON TANK TRUCK.




RINGS FOR SERVICE STATION GROUNDING DEVICE CONNECTION
GROUND CLAMP
TERMINAL EYE
INTERMEDIATE CHAIN TO BE FIRM AT ALL POINTS, SUCH AS A BRIGHT SURFACE. CHAIN ATTACH GROUND CLAMP. ROLLING TIGHTLY AROUND PIPE. NEXT POINT SAME GROUND CLAMP AND PIPE
RAIL FRAME AND SHORT CHAIN AND TERMINAL AND TROLLEY WITH TO RAIL
THREE (THREE) 20' HEAVY CHAIN ANCHOR DRAG ON THE GROUND.
#1/8 TENSILE CHAIN
COLD SHUT
SLIP HOOK
1/2 TWISTED LINK COMMON COIL CHAIN

DETAIL OF PARTS USED TO MAKE UP GROUNDING CHAIN.

10-22-23 LOCTRELIER CHAMORO TWO

STANDARD OIL COMPANY
INDIANA
SAFETY DEPARTMENT
TANK TRUCK GROUNDING CHAIN
TYPE A

405-40

379

standard design. All of these connections are grounded by digging a hole three feet in the earth for what we call a number 3 paragon grounding sump which is filled with one peck of grounding charcoal to attract moisture to this grounding sump. When the rails, tanks, warehouse, pumps, tank lines and truck is grounded with the truck loading contact, tank and the tank truck static bell, it makes a complete grounding circuit of all equipment used in loading and unloading gasoline from the tank cars and the storage tanks or from the storage tanks to the tank truck.

The plaintiff then introduced in evidence Plaintiff's Exhibits S, T, U, and V, as follows:

(Here follow said exhibits, marked side folio pages 399, 400, 401, 402, 403, 404, 405, and 406)

[fol. 407] To which the defendant objected as not being shown that the location shown by the exhibits was the same as at Marysville.

To which action of the master in overruling the objection, the defendants excepted.

Exhibit U is a detail of the unloading system grounding device and V detail of the truck grounding device.

Redirect examination:

This is the way we proceed to measure the contents of the storage tank. We have a hard maple stick finished smoothly to which we apply several coats of orange shellac properly graduated in accordance with the number of inches we wish to measure. We are able to secure approximate measurements. I think it is very uncertain as to the exact amount of gasoline which you can obtain by this measuring device. That usually is caused by not having the stick injected into the tank at perfect right angles or on account of the liquid running up on the stick. I have known measures to be taken for auditors, five or six measurements, and each of them different. There would be variations as much as twenty-five or thirty gallons, pretty generally there are. I know of no means by which the contents of tanks can be more accurately measured and I know

of no stick or any preparation that can be placed upon a measuring stick upon which gasoline will not crawl.

Cross-examination:

These tanks are 10 x 29.6 and hold approximately 17,331 gallons. The number of gallons to an inch at the largest point is 185. If you computed it for one-sixteenth of an inch it would be eleven and nine-sixteenths. We do not graduate our sticks to one-sixteenth because it is useless. I never used any graduated to thirty-seconds of an inch and never heard of any that had that slight a graduation. I never did use the method of measurement which Dr. Cady told about of letting the stick down from the top to the point where you can see where the point broke the surface of the liquid and take your measurements. However, I have an opinion as to whether it could be used satisfactorily, which opinion is based on the fact that all tanks are not of the same cylindrical proportions. After they have been moved they change their shape slightly by reason of construction work and the weight of the liquid in them so any stick you might get with them would not be right. We first get the stick and then make a calibration chart. I do [fol. 408] not know whether the plan of measuring from the top could be successfully used or not. I do not take the change of temperature into consideration. It would have an effect but we do not take that into consideration in making a check at these stations. We have thousands of agents that have been with us for years and it is not a fact that one of the sources of argument when we go there and check a man out is because of claims by him and counterclaims by us respecting the shortage. If there is any material change in the volume of gasoline by temperature change he has the same advantage that we have. We take care of in what we call outage any claims encountered on account in tank cars that have been shipped from down in southern Kansas to places where it is colder. They do not fill them up to the capacity of the shells. I know nothing about refinery calculations in shipping and we do not take temperature at a supply station. I think we would be able to get more accurate measurements if we did. I would not say that we could get more accurate knowledge

of the contents of these tanks by taking the amount that is shipped and placed in them and deducting therefrom the amount shipped out because the human element enters into the handling of these products and some of the stock cannot be accounted for. I know from the records that the amount of stock that was burned or destroyed in the Greenleaf fire was 3,811 gallons. That was lost by fire. The amount that remained in the tank after the fire was 15,477 gallons.

I have been with the Standard Oil Company twenty-seven years.

Mr. Hopkins, called by the plaintiff as a witness in rebuttal, testified as follows:

(Trans. of Ev., Vol. 3, pp. 717-721)

Q. State, Mr. Hopkins, whether you have an opinion as to the relative value for the purpose of building storage tanks of approximately 17,000 gallons of cast iron and steel?

The Master: He may testify.

Mr. Bennett: We object as no proper foundation having been laid. It was laid the other day.

I do consider it impracticable to build cast iron tanks of approximately 17,000 gallons capacity because that is a brittle material. I do not think it is practicable to cast cast iron in tanks of that size. If they were put together in sections then they would be more apt to crack and break. [fol. 409] You could not depend on them like steel. If you had galvanized plates of this thickness of course you could build them of galvanized iron but during the construction of the tank the vital parts of the tank and the parts where leaks occur the galvanizing would be worn or chipped off or scaled off by the action of your tools if you riveted it or if it was a welded tank it would be burned off with your torch. We consider riveting very much more reliable than welding because it is hard to tell when a welded seam is welded properly. You cannot tell whether it is solid weld clear through the seam or not. It may be solid on the sur-

face and look all right and then inside it may not be fused or run together. Welding is considerably cheaper than riveting. The relative pressure of pressure stills and storage tanks of the kind involved here is about one hundred to one, that is a pressure-still will operate under pressure of ninety-five to one hundred times greater than the average storage tank, and the pressure of the pressure still is about one hundred times as great as that of the storage tank.

Q. Have you an opinion, Mr. Hopkins, as to whether or not any barometric change would produce a suction inside a storage tank of the kind described sufficient to permit the introduction into the tank through the manhole vent of flame enough to cause an internal combustion against the pressure from within sufficient to raise a manhole weighing approximately twenty pounds?

Mr. Bennett: I don't believe Mr. Hopkins has qualified himself to that extent. He qualified as a practical man in the superintending of building of refineries, that is a highly technical question.

The Master: I should think that a man 27 years in this business would have an opinion.

A. I don't think it would be possible to introduce flame through a manhole of that kind. For instance, on stills we have a relief valve that operates the same as this manhole. It will raise a few ounces pressure—that is these are not pressure stills—atmospheric stills—and I have seen a number of the stills with the vapor blowing out from these manholes and burning and as soon as this slight pressure is relieved from the still the vapor—the manhole drops and the fire is out at the manhole. The manhole likewise would drop before the exterior pressure has left the still, there is no chance for fire to enter there.

Q. Because of the physical pressure from within?

[fol. 410] A. Yes, and because with vapor leaving a still or tank you would not have a combustible mixture in the tank. It will be all vapor and your manhole would drop before the air would enter.

Q. You have an opinion as to whether or not a ground or lightning arresting device of the character mentioned

by Mr. Wagner would increase or decrease the danger of lightning?

A. I think it would decrease the danger of lightning.

Q. Mr. Hopkins, will the seams of a steel tank of the character mentioned part under heat below the line or surface of the content?

A. Below the surface of the liquid?

Q. Yes?

A. It should not.

Q. Will it?

A. No, I don't think it will because you couldn't get the metal hot enough to distort it or pull it out at the seams.

Cross-examination:

I am not familiar with the B-flash of lightning but I do not think it would go down in the manhole. It would go to your tank because it is a perfect conductor. We test the tanks and joints before we put them in use. A welded tank could be tested so far as pressure is concerned to see whether it would stand one pound of pressure or not.

Redirect examination:

Pressure does not always bring out the defects. It might be a strain in the metal from expansion or contraction. A tank under ground, they haven't free action of expansion or contraction and it may break a weld, and you would not know whether it was broken or not. Testing of the tank would not bring that out.

IN UNITED STATES DISTRICT COURT

ORDER APPROVING STATEMENT OF EVIDENCE PRESENTED BY PLAINTIFFS—Filed April 15, 1927

Now, on this fifteenth day of April, A. D. 1927, the above entitled cause came on for hearing upon the application of parties for settlement of the condensed statement of the evidence. And the Court, having considered the statements

presented by the plaintiffs and the defendants, and being fully advised in the premises, finds that the statements pre-
[fol. 411] sented by the plaintiffs should be and the same is approved by the court and ordered filed as the statement on appeal.

To which finding and order of the courts the defendants and each of them, object and except.

John C. Pollock, U. S. District Judge.

In United States District Court

Defendants' Præcipe for Transcript—Filed May 10, 1926

To the Clerk:

You will please prepare a Transcript of the Record in the above entitled cause, to be filed in the United States Circuit Court of Appeals for the Eighth Circuit, pursuant to an appeal allowed in the above entitled cause, and include in such Transcript of Record the following pleadings, proceedings, and papers, on file, to-wit:

Amended Bill of Complaint of the Standard Oil Company, a corporation, in No. 652-N.

Amended Bill of Complaint of the Sinclair Refining Company, a corporation, in No. 653-N.

Order for Consolidation and Reference, dated October 6, 1924.

Answer to Amended Bill of Complaint of Standard Oil Company.

Answer to Amended Bill of Complaint of Sinclair Refining Company.

The Findings of Fact and Conclusions of the Special Master.

Defendants' exceptions to Special Master's Findings and Conclusions.

Plaintiffs' exceptions to Special Master's Findings and Conclusions.

Plaintiffs' motion to confirm Special Master's Report.

Order of Revivor, Ruling on Plaintiffs' Exceptions and Order of Submission, dated May 2, 1925.

The Decree of the Court appealed from, dated December 22, 1925.

[fol. 412] Memorandum of Decision on exceptions taken by defendants to Report of Special Master.

Petition for Appeal, with order allowing the same.

Assignment of Errors.

Bond.

Citation.

Statement of the Evidence as Lodged.

Harry W. Colmery, Edgar C. Bennett, Solicitors for the Defendants.

I hereby acknowledge service of a copy of the above Transcript this 10th day of May, 1926.

Thomas F. Doran, Solicitor for Plaintiff, The Sinclair Refining Co.

IN UNITED STATES DISTRICT COURT

PRÆCIPE OF PLAINTIFFS, STANDARD OIL COMPANY, A CORPORATION, AND SINCLAIR REFINING COMPANY, A CORPORATION, INDICATING THE PORTIONS OF THE RECORD IN THE ABOVE-ENTITLED CONSOLIDATED CASE WHICH THEY EACH DEEM ESSENTIAL TO THE PROPER DECISION OF THE QUESTIONS PRESENTED BY THE APPEAL HEREIN—Filed June 30, 1926

To the Clerk:

You will please prepare a Transcript of the Record in the above entitled consolidated case, to be filed in the United States Circuit Court of Appeals for the Eighth Circuit, pursuant to an appeal allowed in this consolidated case and you will please include in the transcript of record the following pleadings, proceedings, papers on file herein, together with the statement of the evidence lodged with the Clerk herein by Plaintiffs, to-wit:

Amended Bill of Complaint of the Standard Oil Company, a corporation, in No. 652-N.

Amended Bill of Complaint of the Sinclair Refining Company, a corporation, in No. 653-N.

[fol. 413] Order for Consolidation and Reference, dated October 6, 1924.

Answer to Amended Bill of Complaint of Standard Oil Company.

Answer to Amended Bill of Complaint of Sinclair Refining Company.

The Findings of Fact, Conclusions of Law, and Recommendations of the Special Master.

Defendants' Exceptions to Special Master's Findings and Conclusions.

Plaintiffs' Exceptions to Certain Parts of Finding No. 81 of the Report of the Special Master herein; filed February 13, 1925.

Motion of Plaintiffs for the Entry of an Order Approving and Confirming the Master's Report, when modified under their Exceptions filed herein; filed February 13, 1925.

Order of Revivor; Ruling of the Court on Exceptions filed by the Standard Oil Company and Sinclair Refining Company, to a part of Finding 81 of the Report of the Special Master herein, insofar as agreed upon by the Parties hereto; Order of Submission. All of said Orders and Rulings of the Court being embodied in different paragraphs of one written instrument, dated May 2, 1925, and filed May 25, 1925.

The Decree of the Court herein Appealed From, dated December 22, 1925, including Exceptions Preserved by Plaintiffs to that Portion of Finding No. 81 not heretofore by Agreement and Journal Entry Stricken out.

Memorandum of Decision on Exceptions taken by Defendants to Report of Special Master.

Petition for Appeal, with Order allowing the same.

Assignment of Errors.

Bond.

Citation.

Statement of the evidence lodged with the Clerk of this Court by the Plaintiffs, which statement includes not only "Statement of Evidence—Narrative Form of Testimony" lodged with the Clerk by the defendants, but such addi-

[fol. 414] tional portions of the evidence as the Plaintiffs deem essential to the proper decisions of the issues presented on appeal herein.

Standard Oil Company, by Earl Evans, its Solicitor and Attorney. Sinclair Refining Company, by Thomas F. Doran, its Solicitor and Attorney.

Clerk's certificate to foregoing transcript omitted in printing.

[fol. 415] Appearances of counsel omitted in printing.

[fol. 416] Minute entry of argument and submission December 20, 1927, omitted in printing.

[fol. 417] In United States Circuit Court of Appeals, Eighth Circuit—May Term, A. D. 1928

No. 7868

City of Marysville et al., Appellants,

vs.

Standard Oil Company et al., Appellees

Appeal from the District Court of the United States for the District of Kansas

Mr. Edgar C. Bennett and Mr. Harry W. Colmery for appellants.

Mr. Earle W. Evans, for appellee Standard Oil Company, and Mr. Thomas F. Doran, for appellee Sinclair Refining Company (Mr. C. W. Martyn, Mr. R. R. Vermilion, Mr. Joseph G. Carey, Mr. W. F. Lilleston, Mr. Henry V. Gott, Mr. Roy T. Osborn and Mr. Clayton E. Kline, on the brief), for appellees.

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Before Stone and Van Valkenburgh, Circuit Judges, and Phillips, District Judge

OPINION—Filed May 28, 1928

VAN VALKENBURGH, Circuit Judge, delivered the opinion of the court:

On the 8th day of October, 1923, the Mayor and Council of the City of Marysville, Kansas, passed and approved Ordinance No. 350 in the words and figures following:

"An ordinance regulating the storage of gasoline, kerosene, naphtha, distillate, fuel oil, crude oil, and other in- [fol. 418] flammable and combustible liquids within the city of Marysville, Kansas, and repealing Ordinance No. 333 and Section 4 of Ordinance No. 237

Be it ordained by the Mayor and Council of the City of Marysville, Kansas:

Section 1. It shall be unlawful for any person, firm or corporation to keep or store within the corporate limits of the city of Marysville, Kansas, any gasoline, kerosene, distillate, fuel oil, crude oil, or other inflammable or combustible liquid otherwise than in tanks, barrels or other containers which shall be buried at least three feet under ground.

Sec. 2. Any person, firm or corporation who shall maintain any underground tank-yard shall keep same fenced securely and shall keep at least six inches of gravel, chat, cinders or other large aggregate over the said area so occupied by tanks, and shall keep and maintain such tank-yard in a clean, orderly manner, free from rubbish, weeds, trash or other inflammable substances.

Sec. 3. This ordinance shall in no case apply to the storage of any crude oil, distillate or fuel oil in containers of a capacity of 500 gallons or less, but only one such 500 gallon container shall be permitted on each premises, nor, shall it apply to the storage of gasoline, kerosene or naphtha in quantities of less than ten gallons, all of which commodities in the quantities mentioned and permitted by this section shall be kept and stored in the manner as now provided by existing ordinance.

Sec. 4. Ordinance No. 333 and Section 4 of Ordinance No. 237 are hereby expressly repealed.

Sec. 5. Any person, firm or corporation violating any of the provisions of this ordinance shall upon conviction be adjudged to pay a fine of $25.00 for each such violation, and each day that any of the commodities herein referred to are stored in violation of the terms hereof shall constitute a separate and distinct offense hereunder.

Sec. 6 Any person, firm or corporation now storing any of the commodities herein mentioned in a manner other-
[fol. 419] wise than that herein provided shall be given until the 10th day of November, 1923, in which to bring themselves within the provisions hereof and comply herewith.

Sec. 7. This ordinance shall be in force and take effect from and after its publication in the official city paper."

Ordinance No. 237 therein referred to, passed July 13, 1914, contained a provision that "isolated tanks, constructed for the storage of gasoline, fuel oil and motor spirits, in quantities of 5,000 gallons or more, may be constructed above ground at such locations as the Mayor and City Council may determine." Appellees filed bills of complaint in the district court for the District of Kansas charging that the provisions of said Ordinance No. 350 requiring them to bury their tanks underground are arbitrary, unreasonable and impossible of performance "in that said tanks cannot be buried and that the enforcement of said ordinance will result in the absolute confiscation of plaintiff's property; in an unlawful and unjust discrimination against plaintiff, and in a denial to plaintiff of the equal protection of the laws and in the deprivation of its property without due process of law, in violation of the Fourteenth Amendment to the Constitution of the United States, above quoted, and of the Constitution and Laws of the State of Kansas," and praying that said ordinance be declared arbitrary, unreasonable, discriminatory and void for the reasons stated. Among other things, it was alleged that the ordinance was ultra vires the powers of the Mayor and Councilmen to pass because of lack of antecedent legislative authority conferred; that said tanks were constructed by permit procured from the Mayor and Council under the

provisions of said Ordinance No. 237, and had been in operation for a long period without accident or injury to persons or property; that the business connected with the use thereof had been and was being carried on in a sanitary, safe and legitimate way and was equipped, maintained and operated with the most modern, efficient and best safety appliances and devices known; that it is more dangerous from the standpoint of public safety to operate oil tanks of this kind under ground than to maintain and operate them above ground in the manner in which they are now maintained and operated; that the storage of such products in tanks operated above ground adjacent to railroads and railroad switches within cities and towns, in-
[fol. 420] cluding the City of Marysville, is a safe, useful, convenient and necessary incident and practice of the business required by modern methods of commerce, transportation and habits of life. The permission in the ordinance that smaller quantities of petroleum products may be stored above ground is attacked as discriminatory and as denying to appellees the equal protection of the law.

The cases were consolidated for trial and referred to a Master, who made voluminous findings of fact and recommended a decree declaring said Ordinance No. 350 to be arbitrary, unreasonable, discriminatory and confiscatory of appellees' property in violation of appellees' rights, and that appellants be perpetually enjoined and restrained from enforcing or attempting to enforce said ordinance. All exceptions to the Master's report, except that of appellees' to a portion of finding No. 81, were overruled and a decree was entered conformably to the recommendation of the Master.

This controversy may be decided almost entirely upon the facts found by the Master. The Mayor and Council of the City of Marysville were led to pass and approve the ordinance in question by the following facts thus stated by the master.

"The record shows fires at five storage stations in Kansas; two in 1919, two in 1922, and one in December, 1923. (The latter about two months after the ordinance was passed). • • •

At Hays, Kansas, in November, 1919, tanks of the Standard Oil Company containing gasoline and kerosene burned

and exploded. One end of the gasoline tank was blown out and against an elevator 82 feet away, which it burned completely, whereas the main part of the tank was hurled in the opposite direction a distance of 475 feet, breaking off an eight-inch spruce tree en route and lodging against and burning up a dwelling house where it struck, and in the course of its travel killing nine people, wounding at least twenty-six more and burning several other houses.

Fires at storage stations have occurred which so heated up the contents in the storage tank as to burst open the seams thereof and let gasoline run out and along the ground, burning in a flowing flame as it ran, igniting other [fol. 421] property 30 to 60 feet away; and at other fires the flames have been known to shoot up into the air 50 to 100 feet high and be swept by the wind and set fire to and burn up property 60 to 75 feet distant therefrom.

That the danger of fire to warehouses adjacent to storage tanks is great owing to the fact that there are kept and stored therein oils, greases and petroleum products which are highly combustible, easily ignited and difficult to extinguish, and many instances have occurred where warehouses and storage tanks have become ignited by backfires from automobile trucks, sparks from the gasoline engines used to pump the products to and from the storage tanks, sparks from static electricity created by the abrasion of metallic bodies, or otherwise, in which cases tank wagons and smaller barrels and containers of petroleum products in the warehouses have exploded. Such fires produce extreme heat around the storage tanks, have broken the connections, or melted off the valves, thus permitting the gasoline to flow out of the tanks and burn, adding to the fire and intensity of the heat, and in those cases should a safety device fail to operate or should more gas pressure be formed than the venting devices could relieve, an explosion would occur."

Other destructive fires were at McCracken, Greenleaf and Fort Scott, all in the State of Kansas. The recital of the Master and his conclusions with respect to the danger from fires in spite of all possible precautions and the employment of safety devices is fully supported by the evidence and by court decisions dealing with such questions. In

Whittemore v. Baxter Laundry Co., 148 N. W. 437 (Mich.), the court said:

"We may also concede in the instant case, every precaution that human ingenuity has conceived has been made in the construction of the tanks as testified to by defendants' experts considering, however, the dangerous character of the substance and its power as an explosive of which in this age • • • we can well take judicial notice, and also considering human fallibity that accidents in the operation of the most perfect mechanism will occur and all that needs to change what is a harmless agency, when properly protected, to a most dangerous explosive, is a careless person, can it be said that to have 20,000 gallons of such an agency stored within a few feet of one's dwelling house is not sufficient to be an unreasonable interference with the comfortable enjoyment of homes."

[fol. 422] And in State v. Cozad, 113 Kan. 200, the court said:

"It is well settled that the courts may take judicial notice of the inflammable and explosive qualities of gasoline and kerosene • • •." (202)

"We take judicial cognizance of the fact that gasoline either alone or mixed with kerosene constitutes a high explosive agent. (McLawson v. Paragon Refining Company, 164 N. W. 668 (Mich.)

"We may grant that the storage of gasoline on premises adjacent to other adjoining premises is not a private nuisance per se. It may, however, become such considering the locality, quantity and the surrounding circumstances and would not necessarily depend upon the degree of care used in its storage. (Heeg v. Licht, 80 N. Y. 579; 29 Cyc. 1177)."

See also, O'Hara v. Nelson, (N. J.) 63 Atl. 811, and Waters Pierce Oil Company v. Mayor, etc., 47 La. Ann. 863. To these citations unlimited additions may be made.

The tanks of the Standard Oil Company are located in Block 40 of the original town of Marysville; those of the Sinclair Company in Block 71 in said city. The findings of the Master as to the proximity of structures to these two blocks are extended. A few only of such findings will be quoted in order more clearly to disclose the environment.

"(b) In the north half of Block 40, in a northwesterly direction from the Standard tanks, a hotel property occupies all said north half, except the extreme west and that extreme east which is taken up by the railroad right-of-way. The hotel is a two and one-half story structure 40x80 feet, and is 145 feet from the Standard tanks. Southwest of the hote*l* and adjacent to the alley, running through the center of Block 40, is a large combined garage and barn. On the northwest corner there is a residence 32x36 facing west on Sixth Street, in the rear of which, adjacent to the alley running through the center of Block 40, is a combined office and garage building. This home took first prize for beautiful homes in a contest in the City of Marysville.

(c) The tanks of the Standard Company are a little less than two blocks south of Broadway, which is the main busi-[fol. 423] ness street in the City of Marysville, and approximately 300 feet south of the edge of the fire limits on the north side of Elm Street.

(d) The south half of Block 21, lying immediately north of Block 40, is almost entirely used by the city for storing machinery, material and tools, but in the southwest corner there is a residence with a barn and two out-buildings. The north half of Block 21 faces on Broadway Street, and is occupied by business property in the nature of a shoe store, barber shop, a large clothing store and the city hall, a cafe and a city store-house.

(e) Block 22, lying northeast of Block 40, is almost entirely business property. The north half fronts on Broadway and is solidly constructed. The south half contains a studio, a hotel, a large service garage, two small garages, a residence and a new building under construction which is 305 feet from the Standard tanks.

(r) That within a radius of 100 feet from the center of the Standard Oil Company's tanks there are one residence, a warehouse, frame tool-house and the large coal-bins. Within 200 feet there are four residences, two hotels, one warehouse, one tool-house, a cement-block works, the large coal-bins, and six out-buildings. Within a radius of 400 feet there are nineteen residences, three hotels, warehouse, tool-house, large ice plant, cement-block factory, three busi-

ness buildings and twenty barns, garages and other out-buildings. Within a radius of 500 feet there is practically all the property heretofore described as in Blocks 40, 21, 22, 39, 52, 51, 50 and 40.

Respecting the property of the Sinclair Company these additional findings are made:

(b) Facing west and about midway of the South half of Block 71, and on the extreme west side thereof, is the frame residence of J. H. Riepen, which is distant from the tanks of the Sinclair Company 58 feet. For a number of years prior to the erection of said tanks said residence has existed at said location and has been occupied continuously by J. H. Riepen as his residence up to the present time. Immediately back of his residence there are two small frame out-buildings, 16 feet distant from the Sinclair tanks, and on the northeast corner of said property is a frame barn or shed, 27 feet from the Sinclair warehouse, and immediately across the alley north from this barn are several other frame sheds.

[fol. 424] (c) That across the spur tracks, a distance of 62 feet from the Sinclair tanks, are two upright storage tanks of the Derby Oil Company, east of and in close proximity to which is the warehouse of said Company; that further east are two upright storage tanks of the Cities Service Oil Company, a distance of 110 feet from the Sinclair tanks, and immediately north and a few feet distant is the warehouse of the Cities Service Company.

(d) That along the right-of-way of the Union Pacific Railroad Company in Block 71, and on the east side of the spur track, extending north-east and south-west of and across the alley dividing said Block, there is a coal-shed of the Bone-McLucas Lumber Company, 130 feet in length and 16 feet wide, of wooden construction, the south-west corner of which is approximately 75 feet from the Sinclair tanks, about the same distance from the tanks of the Cities Service Company, and about 60 feet from the tanks of the Derby Oil Company. In this coal-shed is stored large quantities of coal.

(e) In the North Half of Block 71, toward the west and facing north on Spring Street, is a two-story frame resi-

dence 166 feet from the Sinclair tanks; east of that there is another frame residence, immediately east of which is the warehouse and truck-house of the Fenwick Oil Company, together with the three storage tanks of that Company buried underground.

(f) In Block 50, lying directly north of Block 71, the south half is occupied by four residences, two of which face south on Spring Street and two east on Sixth Street, together with three out-buildings, barns, garages, etc.; and in the north half of Block 50 there are four residences, three facing north on Walnut Street and one facing east on Sixth Street, together with five barns, garages and out-buildings."

The foregoing form but a small part of the structures found by the Master to be located well within the danger line established by the experience of the fire at Hays, Kansas, in November, 1919, to which reference has been made.

Other findings to which consideration is invited are that the Standard Oil Company, for more than twenty years prior to the commencement of this action, had maintained [fol. 425] its storage stations upon its property in Marysville; that its tanks are not within the fire limits of the city; that it maintains there two tanks with a capacity of 17,000 gallons each; that they are equipped with the best and most efficient safety devices and are operated in a careful and efficient manner; that it maintains more than 12,000 tanks similar to those in Marysville, and that within the five years last past has had but sixty-six fires in connection with such property; that its storage tanks in the City of Marysville cannot be operated if buried as required by the provisions of the ordinance; that the maintenance and operation thereof under ground would be more dangerous to property and persons than the maintenance and operation above ground; that the location of said tanks is in a sparsely populated portion of the city; that there are no changed conditions in the buildings or improvements around the tank which would warrant or justify that said tanks should be buried as required by the ordinance; that the same present no greater fire hazard than would a frame building or a stock of groceries in a frame

building at the same location; that the action of water upon cinders, which are used for ballast upon the track of the Union Pacific Railway, which is about twenty feet from said appellant's station, creates an acid that corrodes and otherwise injures steel; that the natural flow and drainage is toward and upon the property occupied by the tanks of the Standard Oil Company; that there are numerous above ground tanks in Marysville containing from one hundred to five hundred gallons of distillate and fuel oil which are maintained above ground under the authority of the ordinance and in close proximity to frame residences and business buildings; that under the ordinance any quantity of crude oil less than five hundred gallons may be stored in tanks above ground; that crude oil is more dangerous than is gasoline or kerosene and presents a greater hazard; that under the terms of the ordinance it is unlawful to keep more than five gallons of gasoline in a tank of an automobile, and a garage-keeper, who stores cars, the tanks of which contain gasoline, violates the ordinance.

With respect to the Sinclair Company, it is found that that appellee has two tanks of the capacity of 12,000 gallons each; that it has maintained and operated them for a period of fourteen years prior to the commencement of this action; that one is used for the storage of gasoline and the other for the storage of kerosene; that each of said tanks is so constructed that it cannot be buried as required [fol. 426] by the provisions of the ordinance, and that compliance with the ordinance would result in almost a total loss of said tanks and equipment. The greater safety of storage above ground as compared with that under ground is re-stated.

Near the close of his report, under the numbers 82, 83, 84, 85 and 86, the Master makes findings, largely in the nature of a resume, which greatly modify and condition many of his previous findings and conclusions:

"That distillate and fuel oil are not nearly so dangerous as gasoline and kerosene.

That the objections which the plaintiffs make to the storing of gasoline and kerosene in tanks buried underground are that the maintenance of said tanks is very difficult; should leaks occur they could not be discovered and the

contents might penetrate through the earth, get into sewers, wells and basements, and contaminate water and cause explosions; and that such leaks would develop through the effect of electrolysis and corrosion, eating out the metal of the tank, vibration and temperatures changing loosen the seams, and by the tanks being "floated out" and breaking connections. With reference to the above objections the evidence shows.

(a) That the conditions which produce electrolysis are not present in the City of Marysville, nor in Block 40 and 71, where the tanks of the plaintiffs are located.

(b) That the conditions which produce corrosion of metal underground are the acids in the soil combining with the oxygen in moisture, and sulphuric acid is a dangerous corrosive; and considering all the acid in the soil at the property of the Standard Oil Company in Block 40 as sulphuric acid, it tests .049 to .07 per cent acid, and that the property of the Sinclair Company in Block 71 tests .025 per cent acid. Although there is more chance of corrosion of metal underground of the Standard Oil Company property, it might take a term of years for it to occur.

(c) That under the conditions existing in and around Blocks 71 and 40 in the City of Marysville there would be vibration that might weaken the seams in tanks buried under ground.

[fol. 427] (d) That the evidence shows that the seams of a tank under ground might be weakened by temperature changes to such an extent as to cause the tank to leak. Such tanks are, however, subject to less changes in temperature than tanks above ground.

(e) That tanks buried under three feet of ground in Block 71 have not floated out during periods of rather heavy rain-fall, and any danger of floating can be overcome by proper drainage of the surface water by mounding up the earth, and by weighting, strapping or anchoring down the tanks.

(f) That tanks buried in compliance with Ordinance No. 350 would rest on a level thirteen feet below the level of

the ground; that the only sewers in and around Blocks 71 and 40 are ten and one-half feet below the level of the ground, and the evidence does not show that there are any wells anywhere in the vicinity. The soil in Blocks 71 and 40 is a heavy black gumbo, shading gradually into a compact plastic yellow clay, and tests made thereof by attempting to force water through the same by exerting a pressure of fourteen pounds per square inch for two and one-half hours, showed that only a few small drops of water came through, and the same test with gasoline, no gasoline came through.

That the danger from fire or explosion due to lightning, which causes a great many fires in oil storage, is less in underground tanks than in above ground tanks.

That the danger from fire or explosions due to static electricity is less in underground tanks than in above ground tanks.

That the base rate of insurance on storage tanks of gasoline and kerosene underground is fifty per cent of the base rate of tanks above ground."

As stated in brief and argument, the only question presented is whether the ordinance is so clearly arbitrary and unreasonable that it amounts to an improper exercise of the police power. Some well established principles of law effectually remove from consideration many of the findings deemed to support the conclusion reached that the provisions of the ordinance assailed are arbitrary, capricious, discriminatory and unreasonable.

[fol. 428] This same ordinance was before the Supreme Court of Kansas in Cities Service Oil Co. v. City of Marysville, 117 Kas. 514. The ordinance was upheld on the ground that under the statutory power conferred upon the city "to enact all such ordinances as may be expedient for maintaining the welfare of the city, the council may regulate the manner in which kerosene and gasoline may be stored within the corporate boundaries. To this ruling, by the highest court of the state, that the ordinance is within the scope of the power conferred on the municipality by the legislature, we should, and do, accord conclusive force. Reinman v. Little Rock, 237 U. S. 171. The Fourteenth Amendment does not prevent regulation in-

tended to regulate useful occupations which, because of their nature and location, may prove injurious to the public. Murphy v. People of the State of California, 225 U. S. 623.

"An ordinance passed in the exercise of the police power should be sustained if there is room for a difference of opinion as to whether or not the public safety will be promoted thereby." McCray, et al. v. City of Chicago, 292 Ill. 60.

One who assails such an ordinance bears the burden of showing that it does not rest upon any reasonable basis, but is essentially arbitrary. Lindsley v. Natural Carbonic Gas Co., 220 U. S. 61-79.

"If there is room for a fair difference of opinion as to the reasonableness of a municipal regulation the courts will not hold it void." 43 Corpus Juris, par. 315, pp. 302-303; Dillon on Municipal Corporations, 5th Ed., vol. 2, sec. 591, pp. 928-929.

"Every intendment is to be made in favor of the lawfulness of the exercise of municipal power making regulations to promote the public health and safety." Pierce Oil Corporation v. Hope, (Ark.) 127 Ark. 38; Dessner v. City of Wichita, 96 Kan. 820.

The unreasonableness must be shown affirmatively and clearly. City of Chicago v. Washingtonian Home of Chicago, 289 Ill. 286. Such ordinances may be declared invalid only when it plainly appears that they do not tend in an appreciable degree to promote the public health, safety or welfare and that the power to legislate has been exercised arbitrarily. Stubbs v. Adamson, 159 N. Y. S. 751.

"The right to exercise the police power is a continuing [fol. 429] one and a business lawful today may in the future become a menace to the public welfare and be required to yield to the public good." Dobbins v. Los Angeles, 195 U. S. 223.

"The courts will not inquire into the expediency of legislation passed in the exercise of the police power, nor the reasons which prompted its adoption, so long as it appears that the legislative authority acted in good faith, in the exer-

cise of a reasonable discretion, and not arbitrarily; nor will they overthrow such legislation merely because they differ with the lawmaking power as to its efficiency, when opinion is divided on the question." Union Oil Co. v. City of Portland, 198 Fed. 441.

In Missouri Pacific Railway Company v. Humes, 115 U. S. 512-520, the court said:

"If the laws enacted by a state be within the legitimate sphere of legislative power, and their enforcement be attended with the observance of those general rules which our system of jurisprudence prescribes for the security of private rights, the harshness, injustice, and oppressive character of such laws will not invalidate them as affecting life, liberty or property without due process of law." Rast v. Van Deman & Lewis, 240 U. S. 342.

"While the police power of the state cannot be so arbitrarily exercised as to deprive persons of their property without due process of law or deny them equal protection of the law, it is one of the most essential powers of government and one of the least limitable—in fact, the imperative necessity for its existence precludes any limitation upon it when not arbitrarily exercised.

A vested interest cannot because of conditions once obtaining be asserted against the proper exercise of the police power—to so hold would preclude development. Chicago & Alton R. R. v. Tranbarger, 238 U. S. 67; Hadacheck v. Sebastian, 239 U. S. 394."

That property may be destroyed as a result of the legitimate exercise of the police power of a state is not a taking of property for public use, and does not deprive the owner of it without due process of law. Resulting inconvenience or loss to the individual affected will not invalidate. Mugler v. Kansas, 123 U. S. 623; Slaughter-House Cases, 111 U. S. 746; Commonwealth v. Nolan, (Ky.) 224 S. W. 506; [fol. 430] City of Chicago v. Washingtonian Home of Chicago, 289 Ill. 286. Judges may not substitute their judgment for that of the City Council fairly exercised. The remedy proposed must have a fair relationship to the danger sought to be minimized or removed. Zahn v. City of Los Angeles, (U. S.) 47 Sup. Ct. Rep. 594. If the question

of reasonableness be fairly debatable an ordinance of this nature will be sustained. Radice v. People, 264 U. S. 292-294.

"Where the object to be accomplished is conducive to the public interest, it (the legislature) may exercise a large liberty of choice in the means employed." Lawton v. Steele, 152 U. S. 133-140.

It is thus apparent that the fact that appellees have maintained their storage stations upon their property for a long period, under permit from the municipal authorities; that the same are equipped with the best and most effective safety devices and are operated in a careful and efficient manner; that the location of the tanks is in a less congested portion of the city, can have no necessarily controlling effect upon the validity of this ordinance. It is in evidence that the city is growing in population and extending in improvements; that development in, about and beyond the location of these tanks is in prospect. It appears from the testimony and the findings that destructive fires have occurred, and loss of life has been occasioned from tanks of the same general nature located as these tanks are; that much property and many people in the City of Marysville are within a potential destructive radius if fires and explosions should occur. It must be conceded that such results are to be apprehended despite every precaution that human ingenuity has conceived in the way of construction, safety devices and careful operation. It is no valid objection that small tanks containing distillate and fuel oil, which are found by the Master to be not nearly so dangerous as gasoline and kerosene, are permitted by the ordinance to be stored above ground. The classification made is sufficiently distinctive. The large storage tanks of appellees, and the nature of their business, may not legitimately be compared with private consumers or those engaged in small retail business. All possible hazards cannot be eliminated in any community.

The Master finds that the storage tanks of the Standard Company cannot be operated if buried as required by the [fol. 431] provisions of the ordinance, and that those of the Sinclair Company are so constructed that they cannot be buried, and that compliance with the ordinance would re-

sult in almost a total loss of said tanks and equipment. We do not think this finding is sustained by the record. Even if it be true that these particular tanks could not themselves be placed under ground without their destruction, that in itself would afford no support to the conclusion reached by court and Master. Mugler v. Kansas, supra. We assume that the Master limited his finding to the particular tanks now upon the ground. He could not have meant that tanks of this size and character cannot be placed under ground, in accordance with the provisions of the ordinance, and operated. It is disclosed, without contradiction, that the tanks of the Fenwick Oil Company, three in number and containing 11,750 gallons each, have been placed under ground in obedience to this ordinance and are operated successfully. Mr. Fenwick states that two of these tanks have been so placed for a period of two years, and one for a period of one year; that inlet and outlet pipes have been installed. When he put down the last of these tanks the side of one of the others was exposed. It was found not to be rusted or corroded and was in as good condition as when installed. With a measuring stick properly treated with paint he is able to guage the amount of liquid in the tanks within ten gallons. He finds that in two years the temperature has never been higher than 65 degrees and never lower than 54 degrees,—a range that within common knowledge would not disturb the integrity of the tanks. He has experienced no leaks and his tanks have never been floated out as contended even during torrential rains that flooded sewers and surface ditches. His experience with tanks has demonstrated that the underground tank has an advantage in that there is less evaporation, and, therefore, less waste. He has found no buckling nor opening of the seams. It will be noted that the Fenwick tanks are in the same city block as the Sinclair tanks. Independently of this testimony, or based thereon, the Master found that any danger of floating can be overcome by proper drainage of the surface water by mounding up the earth, and by weighting, strapping or anchoring down the tanks.

It is urged by appellees that the placing of tanks of this size in underground pits is attended by strain which would inevitably cause leaks. It is entirely conceivable, however, that such tanks can be thoroughly tested after being in- [fol. 432] stalled upon firm foundations and this defect

remedied before they are used as containers. The pit as originally constructed need not, of course, be so restricted to the exact size of the tank that this cannot be done. Also, by concreting and other means the possibility of leaking and resulting seepage may be minimized, if not substantially prevented. It may be that the expense of underground installation would be thus increased, but this, if true, would not militate against the validity of the ordinance. It is also apparent from the experience of the Fenwick Oil Company that the difficulties attending the installation, maintenance and operation of tanks under ground are not insuperable.

Of the objections made by appellees the Master finds further that the dangers to under ground tanks from electrolysis, from lightning, from fires or explosions due to static electricity, are less than in tanks above ground, and that the base rate of insurance on such tanks under ground is but 50 per cent of the base rate of tanks above ground. The judgment of risk companies, founded upon self-interest and wide experience, is very persuasive. The Master also finds that the danger of corrosion in case of the Sinclair tanks is negligible, and in the case of the Standard so remote that it would probably take "a term of years for it to occur." With respect to the seepage the finding is that tanks buried in compliance with this ordinance would rest on a level considerably below that of sewers in and around these blocks. He also finds that "the soil in Blocks 71 and 40 is a heavy black gumbo, shading gradually into a compact plastic yellow clay and tests made thereof by attempting to force water through the same by exerting a pressure of fourteen pounds per square inch for two and one-half hours, showed that only a few small drops of water came through, and the same test with gasoline, no gasoline came through." It thus appears that the danger from seepage into sewers and basements is so remote as to be worthy of small consideration. This finding accords with the best expert testimony introduced. It is true that a number of witnesses, most of them in the service of appellees, testified that in their opinion such seepage danger was to be apprehended. The expert testimony of chemists and fire and water chiefs was conflicting, but in our judgment the

evidence upon this phase of the controversy preponderated in favor of the theory of appellants. The most that can be said in favor of the finding of danger in this respect is that it is a debatable question.

[fol. 433] This leaves the finding that under the conditions existing in and around Block 71 and 40 in the City of Marysville there would be vibrations "that might weaken the seams in tanks buried under ground." This also is debatable and is not justified by the experience of the Fenwick Oil Company, which is the only concrete experience contained in the record.

We are not unmindful of the rule that the conclusions, findings and recommendations of a Master, when approved by the trial court, are presumed to be correct. They are not conclusive, however, and cannot prevail against clear evidence. In this case, however, the burden is upon appellees to establish the unreasonableness, and, therefore, the invalidity of the ordinance, by clear proof. The Master seems to have based his conclusion largely upon considerations of the inconvenience and greater burden imposed upon appellees by the ordinance. Believing that greater danger will result from under ground storage, he has, in large measure, substituted his own for that of the controlling legislative judgment upon facts fairly debatable and subject to reasonable differences of opinion. Furthermore, in his resume he has found that the greater number of the dangers incidental to the storage of gasoline and kerosene are removed by placing large containers under ground. Whether these outweigh those accruing from underground storage is certainly debatable, and if so, the legislative judgment must prevail. The court, stating that the findings were made upon conflicting proofs, and that it had contented itself with such a study thereof as showed that the many findings were supported by ample proofs, adopted and confirmed the findings and conclusions, and entered a decree accordingly. We think that the record presents no evidence of arbitrary or capricious action on the part of the Mayor and Council of Marysville. Their action was taken in good faith for the protection of the property and lives of the public. The remedy proposed bears direct relation to the danger sought to be averted. It is entirely conceivable that a buried tank is less likely to take fire and explode

from many causes which otherwise threaten, and that, if an explosion should occur, the danger to surrounding property would, at least, be minimized. In such case, the municipal judgment must control. With policy, present or future, of the city, or of appellees, the courts can have no concern. It is accepted doctrine that, when the legislature, in an effort to prevent any inquiry into the validity of a [fol. 434] particular statute, so burdens any challenge thereof in the courts, that the party affected is necessarily constrained to submit rather than take chances of suffering the penalties imposed, it becomes a serious question whether the party is not deprived of the equal protection of the laws. Cotting v. Kansas City Stock Yards Co., 183 U. S. 79-102. However, there is no doubt of the power of the state to impose a punishment heavy enough to secure obedience to such orders after they have been found to be lawful. Wadley Southern Ry. v. Georgia, 235 U. S. 651-667. In the latter case the holding in Willcox v. Consolidated Gas Co., 212 U. S. 19-53 to the effect that penalty provisions are separable, and, though invalid, do not defeat the balance of the statute, is approved. In the instant case the penalties provided are neither enormous nor severe; but, rather, are reasonably calculated to secure obedience after the orders have been found to be lawful. Appellees were entitled to take seasonable steps to test the validity of the ordinance. They made their challenge with promptness and in good faith, and prosecuted it with diligence to a final determination. In such case, we do not doubt our power, while sustaining that ordinance, to relieve from such penalties for the period during which this right was asserted, thereby guaranteeing the equal protection of the laws. Being of opinion that the ordinance attacked was passed and approved with authority and in a legitimate exercise of the police power of the city, we conclude that the decree below must be reversed and the cause remanded with directions to dismiss the bill, upon condition that a reasonable time be accorded to appellees to conform to the provisions of the ordinance, and that appellants be perpetually enjoined from enforcing its penalty provisions until the expiration of such time.

It is so ordered.

IN UNITED STATES CIRCUIT COURT OF APPEALS

DISSENTING OPINION—Filed May 28, 1928

PHILLIPS, District Judge, dissenting:

I respectfully dissent from the majority opinion, and shall undertake to state my reasons therefor:

Sec. 7 of Ordinance No. 350 of the City of Marysville, the validity of which ordinance is here in question, provides: [fol. 435] "This ordinance shall be in force and take effect from and after its publication in the official city paper." It was published on October 11, 1923, and hence went into force and effect on that date.

Sec. 5 of this ordinance provides: "Any person, firm or corporation violating any of the provisions of this ordinance shall upon conviction be adjudged to pay a fine of $25.00 for each such violation, and each day that any of the commodities herein referred to are stored in violation of the terms hereof shall constitute a separate and distinct offense hereunder."

Sec. 6 of this ordinance provides: "Any person, firm or corporation now storing any of the commodities herein mentioned in a manner otherwise than that herein provided shall be given until the 10th day of November, 1923, in which to bring themselves within the provisions hereof and comply herewith."

The appellees, Standard Oil Company and Sinclair Refining Company, were engaged in storing in Marysville, the commodities regulated by the ordinance at the time it went into force and effect, and hence under its terms had until November 10, 1923, to comply therewith.

The authority of the City Council of the City of Marysville for the enactment of the ordinance in question was stated by the Supreme Court of Kansas in the case of City Service Oil Co. v. City of Marysville, 117 Kans. 514 515, as follows:

"The authority for its enactment however is to be found in the grant of power to the council 'to enact . . . any and all ordinances not repugnant to the constitution and laws of this state, and such as it shall deem expedient

for the good government of the city' (R. S. 14-401), and 'to enact and make all such ordinances, by-laws rules, and regulations not inconsistent with the laws of the state as may be expedient for maintaining the peace, good government, and welfare of the city and its trade and commerce' (R. S. 14-439), and perhaps also in the section authorizing the council to 'regulate the construction of, and order the suppression of, * * * any appartus used in any * * * business which may be dangerous in causing or promoting fires.' (R. S. 14-421). The ordinance is therefore open to attack not only upon the ground of unconstitutionality, but also upon that of being unreasonable in the circumstances in which its enforcement is undertaken."

[fol. 436] The ordinance having been enacted under the general powers granted to the City of Marysville, its reasonableness is subject to inquiry by the courts. City Service Oil Co. v. City of Marysville, supra; Lusk v. Dora, 224 Fed. 650; Moffitt v. Pueblo, 55 Colo. 112, 133 Pac. 754; Chicago Catholic Bishop v. Palos Park, 286 Ill. 400, 121 N. E. 561, 562; Huston v. Des Moines, 176 Ia. 455, 156 N. W. 883, 892; Tarkio v. Cook, 120 Mo. 1, 25 S. W. 202, 203; Carpenter v. Yeadon, 151 Fed. 879, 882, id. 158 Fed. 766; 43 C. J. 300.

A municipal ordinance will not be declared invalid on the ground of its unreasonableness unless the unreasonableness thereof is made to clearly appear. Crowley v. Christensen, 131 U. S. 86; Guidoni v. Wheeler (C. C. A. 9) 230 Fed. 93. However, when such unreasonableness is clearly established, the courts may declare an ordinance invalid on that ground. Dobbins v. Los Angeles, 195 U. S. 223, 238; Iowa City v. Glassman, 155 Ia. 671, 136 N. W. 899; Standard Oil Co. v. Kearney, 106 Nebr. 558, 184 N. W. 109, 110; 43 C. J., p. 312.

If there is room for a fair difference of opinion as to the reasonableness of the ordinance, the courts will not hold it void on that ground. Hartman v. Chicago, 282 Ill. 511, 118 N. E. 731, 732; Wagner v. St. Louis, 284 Mo. 410, 224 S. W. 413, 415.

The presumption is in favor of the reasonableness of the ordinance and the burden of proof to show its unreasonableness rests on the person asserting it. Real Silk Hosiery

Mills v. Portland, 294 Fed. 587; Yee Gee v. San Francisco, 235 Fed. 757, 763-764; Guidoni v. Wheeler, 230 Fed. 93, 98; Puget Sound Electric R. Co. v. Benson (C. C. A. 9) 253 Fed. 710, 715; 43 C. J., p. 310, Sec. 323. I do not understand the rule to be that there must be no conflict in the evidence, but that it is sufficient if the unreasonableness of the ordinance be established by clear and satisfactory proof. Standard Oil Co. v. Kearney, — Nebr., —, 184 N. W. 109, 110; 43 C. J., p. 312, Sec. 325.

The obvious purpose of the ordinance in question was to promote the public safety by protecting it from danger of fire and explosion. It is well settled that there must be a rational relation between the provisions of the ordinance and the purpose it is intended to accomplish. The provisions of the ordinance must tend toward the accomplishment of the [fol. 437] object for which the power is granted. Ex parte San Chung, 11 Cal. App. 511, 105 Pac. 609, 611; Williston v. Cooke, 54 Colo. 320, 130 Pac. 828, 831; People v. Ericson, 263 Ill. 441, 105 N. E. 314, 317; Froelich v. Cleveland, — Oh. St. —, 124 N. E. 212, 216; Dayton v. City Ry. Co. (C. C. A. 6) 16 Fed. (2d) 401, 403, 19 R. C. L., p. 805, Sec. 112. 43 C. J., p. 227-228.

In the instant case the provisions of the ordinance in question to be reasonable and valid must be reasonably calculated to promote the public safety by decreasing the danger of fire or explosion incident to the storage of the commodities, which the ordinance undertakes to regulate. Dayton v. City Ry. Co., supra, p. 403.

The test in the instant case is whether the requirements of the ordinance will tend to promote the public safety when applied to the storage of gasoline and other like substances in large quantities. The question is whether storage of such commodities in large quantities below ground in accordance with the requirements of the ordinance is less hazardous than the existing practice generally adopted throughout the country of storing such commodities in large quantities in above ground tanks with approved safety devices.

The contention of the appellees was that under ground storage of gasoline, kerosene, and kindred liquids, in large quantities, was much more hazardous than above ground storage. On this point, the Master made findings numbered 28, 45 and 60, which read as follows:

XXVIII

"That the burying by said plaintiff of tanks equal in capacity to those so maintained by it as aforesaid in the City of Marysville as required by said Ordinance No. 350 would be attended with hazards which would render the maintenance and operation thereof underground more dangerous to property and persons than the maintenance and operation of said plaintiff's present tanks above ground."

XLV

"That it is more dangerous from the standpoint of public safety to keep and store gasoline or kerosene in quantities of ten thousand gallons or more under the ground than it is to store the same quantities thereof above ground."

[fol. 438] LX

"That the burying of said plaintiff's tanks, or new tanks of equal capacity, as required by Ordinance No. 350, would be attended by hazards which would render the maintenance and operation of such tanks underground more dangerous to property and persons than the maintenance and operation of said plaintiff's present tanks above ground."

The Master also made the following conclusions of law:

II

"That sections numbered one and three of said Ordinance No. 350 of the defendant, the City of Marysville, Kansas, and each and every provision thereof, is arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of plaintiff, and void."

III

"That Ordinance No. 350 of the defendant, the City of Marysville, is arbitrary, capricious, discriminatory, unreasonable and subversive of the rights of the plaintiffs, and void."

In support of their contention, appellees called a large number of witnesses of expert knowledge based on practical

and extensive experience in the storage and handling of gasoline, kerosene, and like commodities, in large quantities. These witnesses testified that the above ground storage was much safer, and gave very cogent reasons therefor. They stated that in the storage of these products in large quantities, the greatest hazard of fire and explosion comes from leakage; that leakage is much more apt to result and less easily detected in underground storage; that leakage results from corrosion, from strain upon seams and rivets incident to insulation, from change in temperature and like causes. They stated further that leakage in above ground tankage is first indicated by sweating; that it can be readily detected and repaired before the leakage in any substantial amount occurs. They further explained how such leakage under ground could not be detected either from inspection or from measurement; that inspection is prevented because the tank is covered up and measurement is impossible because if the tank is not exactly horizontal the measurement is certain to be inaccurate. They further ex- [fol. 439] plained how gasoline escaping from under ground leakage would travel through the soil to earth pockets, cellars, sewers and the like, and thereby create fire and explosion hazards. As against this, the appellants introduced evidence of witnesses who gave as their opinion that under ground storage is the safer, but none of these witnesses were able to testify from knowledge gained through practical experience in the handling of such products in large quantities. A very analogous situation arose in the case of McCray v. City of Chicago, 292 Ill. 60, 126 N. E. 557. The court in that case said:

"It is argued by counsel for appellees that the evidence shows that there is a fair difference of opinion among those experienced in the use of such materials as to whether or not Preferred Bestwall is a good substitute for wood lath and plaster. It is true that some of the witnesses for the city testified that ordinary Bestwall, or substitutes other than the one here under consideration, less than three-eighths of an inch thick, were not equal to wood lath and plaster, but only one of these witnesses for the city, as we read the record, had ever had any experience with Preferred Bestwall three-eighths of an inch in thickness, such as is here under consideration, and he had only made one test

of this Preferred Best wall, and that while the case was being tried in the superior court, by placing a piece a few inches in size in an oven, where it was tested under a temperature of 221 degrees Fahrenheit.

"A large amount of testimony was taken on behalf of appellants.

* * * * * * *

"These witnesses were men of the highest standing in their respective lines of work, and their testimony was based on an extensive study through a large number of comparative experiments and tests of different kinds of wall material."

In concluding, the court said:

"We agree with counsel for appellees that an ordinance is not discriminatory where it operates on all persons engaged in the same business or calling alike, and where there is no other calling or business in precisely the same position (2 Dillon on Mun. Corp. (5th Ed.) Sec. 593; also that an ordinance that fairly tends to serve and promote the [fol. 440] public health or safety is reasonable (Spiegler v. City of Chicago, 216 Ill. 114, 74 N. E. 718); and that any one attacking an ordinance because unreasonable must show affirmatively where the ordinance is unreasonable (People v. Cregier, 138 Ill. 401, 28 N. E. 812; Swift v. Klein 163 Ill. 269, 45 N. E. 219); that courts will not disturb an ordinance of the character here in question when there is room for a difference of opinion as to whether or not the public safety will be promoted by the provisions of the ordinance (City of Chicago v. Mandel Bros., 264 Ill. 206, 106 N. E. 181); that on a question whether or not a particular thing may or may not be detrimental to public safety, the determination by the legislative body, if it has not acted unfairly or arbitrarily, will be held conclusive. (North Chicago City Railway Co. v. Town of Lake View, 105 Ill. 207, 44 Am. Rep. 788; Laugel v. City of Bushnell, 197 Ill. 20, 63 N. E. 1086, 58 L. R. A. 266). There can be no question, also, that the power to declare an ordinance void because it is unreasonable is one that should be carefully exercised, and the court will not interfere simply because it believes that a

different regulation might have been wiser or better, but the court will not hesitate to interfere when it is clearly manifest from the evidence that the city authorities have acted in an arbitrary manner in passing an ordinance.

"We believe the ordinance in question is unjust and oppressive in its discrimination as to the material to be used for the partitions and ceilings of the rooms in ordinary dwelling houses. This being so, it must be held that these provisions of the ordinance are void, and should have been so declared by the trial court."

Counsel for appellants make the contention that because of the peculiar character of the soil at the points where the tanks of the appellees are located in the city of Marysville, danger from seepage through the soil does not exist. They base this upon a test made by one of their witness in attempting to force water through such soil, under pressure. The majority opinion lays some emphasis on this experiment. Gasoline is today a commodity in common use. Its characteristics are a matter of commmon knowledge. They are so well and commonly known that a court, in my opinion, may take judicial notice thereof. We know that it is extremely difficult to hold gasoline within containers; that it will escape through the smallest opening, and that it will [fol. 441] permeate any kind of soil. Dr. H. P. Cady, upon whose testimony the contentions with reference to the character of the soil are largely based, on cross-examination, testified:

"Nothing in the way of earth is impervious to water, and it is not as impervious to gasoline as it is to water. Gasoline will leak through cracks that will hold water pretty well."

I therefore am of the opinion that the conclusion is inevitable, that gasoline escaping through leakage from underground tanks, regardless of the imperviousness of the soil would probably travel to pockets, cracks, sewers, cellars and like places, as testified to by the witness for the appellees.

The fact that the witnesses for the appellees base their opinions and conclusions upon knowledge gained through practical and extensive experience, the fact that they gave such cogent reasons for their conclusions, and the fact that the conclusions of the witnesses for the appellants were

largely theoretical and not based on practical knowledge and experience, lead me to the conclusion that the evidence on this controverted point clearly and satisfactorily established that the provisions of the ordinance, instead of tending to promote the public safety, tended in the opposite direction, and that compliance therewith would increase, instead of decrease, the hazard from fire and explosion resulting from the storage of gasoline and like substances in large quantities. If this be true, the findings above quoted, made by the Master and confirmed by the trial court, should be adopted by this court.

If these findings are true, the ordinance in question is not reasonably calculated to accomplish its intended purpose, and is therefore unreasonable and void.

Under the terms of the ordinance appellees were required to comply therewith on the 10th day of November, 1923. Instead of complying with the ordinance they attacked its validity and obtained an injunction against its enforcement. If the ordinance is valid and may be enforced according to its terms, appellees are each subject to a fine of $25.00 for each day intervening since November 10, 1923, to the present day. Such fines would amount in the aggregate to many thousands of dollars.

[fol. 442] In Cotting v. Kansas City Stockyards Co., 183 U. S. 79, 101, 102, the court said:

"A statute (although in terms opening the doors of the courts to a particular litigant) which places upon him as a penalty for a failure to make good his claim or defense a burden so great as to practically intimidate him from asserting that which he believes to be his rights is, when no such penalty is inflicted upon others, tantamount to a denial of the equal protection of the laws. * * * It is doubtless true that the State may impose penalties such as will tend to compel obedience to its mandates by all, individuals or corporations, and if extreme and cumulative penalties are imposed only after there has been a final determination of the validity of the statute, the question would be very different from that here presented. But when the legislature, in an effort to prevent any inquiry of the validity of a particular statute, so burdens any challenge thereof in the courts, that the party affected is necessarily constrained to submit rather than takes the changes of the penalties

imposed, then it becomes a serious question whether the party is not deprived of the equal protection of the laws."

In Ex parte Young, 209 U. S. 123, 147, the court said:

"It may therefore be said that when the penalties for disobedience are by fines so enormous and imprisonment so severe as to intimate the company and its officers from resorting to the courts to test the validity of the legislation, the result is the same as if the law in terms prohibited the company from seeking judicial construction of laws which deeply affect its rights."

See also Wadley Southern Ry. Co. v. Georgia, 235 U. S. 651, 661, 666; Missouri Pac. Ry. v. Nebraska, 217 U. S. 196, 207, 208; Missouri Pac. Ry. Co. v. Tucker, 230 U. S. 340, 349; Bonnett v. Vallier, 136 Wisc. 193, 116 N. W. 885; State v. Crawford, 74 Wash. 248, 133 Pac. 590. In Bonnett v. Vallier, the validity of a police regulation concerning the construction of tenement houses was involved.

The majority opinion seems to recognize that the ordinance in question is subject to condemnation because it undertakes to impose extreme and cumulative penalties before there has been a final determination of its validity because it directs that the decree shall accord with the [fol. 443] appellees a reasonable time after such decree is entered, to comply with the provisions of the ordinance, and shall perpetually enjoin the appellants from enforcing the penalty provisions of the ordinance until the expiration of such time. I seriously doubt the power of the court to so decree. The effect of such a decree would be to amend the terms of the ordinance which provide that it shall be in force and effect from and after the date of its publication. In other words, the court, in effect, reads into the ordinance that which in order to render it valid the legislative body of the city should have written into the ordinance but did not; namely, that the cumulative penalty provisions should not attach until after a final determination of the validity of the ordinance. I think we must either permit the city to enforce the ordinance as written, or we must hold the penalty section of the ordinance void because of the severe and cumulative penalties which it imposes.

It is my opinion that the decree below was right and should be affirmed.

A true copy. Attest: —— ——, Clerk U. S. Circuit Court of Appeals, Eighth Circuit.

[fol. 444] In United States Circuit Court of Appeals, Eighth Circuit

No. 7868

City of Marysville, L. N. Cole, as Mayor; R. E. Long, G. F. Bauman, Ed Hall, J. H. Reynolds, Oscar Terry, W. E. Miller, E. G. Filbert, and E. C. Webber, Councilmen; Edgar C. Bennett, City Attorney, and P. Hayes, Marshal, of said City, Appellants,

vs.

Standard Oil Company and The Sinclair Refining Company

Appeal from the District Court of the United States for the District of Kansas

Decree—May 28, 1928

This cause came on to be heard on the transcript of the record from the District Court of the United States for the District of Kansas, and was argued by counsel.

On Consideration Whereof, it is now here ordered, adjudged and decreed by this Court, that the decree of the said District Court, in this cause be, and the same is hereby, reversed with costs; and that the City of Marysville, L. N. Cole, as Mayor, R. E. Long, G. F. Bauman, Ed Hall, J. H. Reynolds, Oscar Terry, W. E. Miller, E. G. Filbert and E. C. Webber, Councilmen, Edgar C. Bennett, City Attorney, and P. Hayes, Marshal of said City, have and recover against the Standard Oil Company and the Sinclair Refining Company the sum of — Dollars for their costs in this behalf expended and have execution therefor.

And it is further ordered by this Court that this cause [fol. 445] be, and the same is hereby, remanded to the said District Court with directions to dismiss the bill, upon condition that a reasonable time be accorded to the ap-

pellees to conform to the provisions of the ordinance, and that appellants be perpetually enjoined from enforcing its penalty provisions until the expiration of such time.

[fols. 446-449] Petition for rehearing, covering six pages, filed July 26, 1928, omitted from this print. It was denied and nothing more by order September 17, 1928.

[fol. 450] In United States Circuit Court of Appeals

Order Denying Petition for Rehearing

September 17, 1928.

This cause came on this day to be heard upon the petition for a rehearing, filed by Counsel for Appellees.

On consideration whereof, it is now here ordered by this Court, that said petition for a rehearing of this cause, be, and the same is hereby, denied.

[fol. 451] In United States Circuit Court of Appeals

Motion to Stay Mandate—Filed July 27, 1928

Comes now the appellees, Standard Oil Company and Sinclair Refining Company, which have this day filed a petition for rehearing, and move the court for an order that issuance of mandate herein be stayed for a reasonable time after counsel for appellees are notified that the petition for rehearing is denied, if such be the action of the court, in order to afford appellees an opportunity to file a petition for writ of certiorari.

Earle W. Evans, Vermilion, Evans, Carey & Lilleston, of Counsel, Attorneys for Appellee Standard Oil Company. Thomas F. Doran, M. F. Cosgrove, Clayton E. Kline, Attorneys for Appellee Sinclair Refining Company.

STATE OF KANSAS,
Sedgwick County, ss:

On this 20 day of July, A. D., 1928, before me, the undersigned, a Notary Public, within and for the County and State aforesaid, came Joseph G. Carey, of lawful age, who being by me first duly sworn, upon his oath deposes and says:

That he is one of the attorneys for the appellee, Standard Oil Company, in the foregoing case and court; that a petition for rehearing will be filed herein in good faith, that it is not made for the purpose of delay, and that in the event this court denies said motion for rehearing, said appellee desires to file a petition for a writ of certiorari in [fol. 452] the Supreme Court, and will, in such event, thereafter file such petition in good faith, with due diligence and without unreasonable delay.

Joseph G. Carey.

Subscribed and sworn to before me this 20 day of July, A. D. 1928. Ethyl McMurry, Notary Public. My commission expires February 22, 1931. (Seal.)

STATE OF KANSAS,
Shawnee County, ss:

On this 21st day of July, A. D. 1928, before me, the undersigned, a Notary Public, within and for the County and State aforesaid, came Thomas F. Doran, of lawful age, who being by me first duly sworn, deposes and says:

That he is one of the attorneys for the appellee, Sinclair Refining Company, in the foregoing case and court; that a petition for rehearing will be filed herein in good faith; that it is not made for the purpose of delay, and that in the event this court denies said motion for rehearing, said appellee desires to file a petition for a writ of certiorari in the Supreme Court, and will, in such event, thereafter file such petition in good faith, with due diligence and without unreasonable delay.

Thomas F. Doran.

Subscribed and sworn to before me this 21st day of July, A. D., 1928. Louie M. Bagley, Notary Public. My commission expires Nov. 26, 1928. (Seal.)

[File endorsement omitted.]

[fol. 453] In United States Circuit Court of Appeals

Order Staying Issuance of Mandate—September 21, 1928

On consideration of the motion of appellees for a stay of the mandate in this cause pending a petition to the Supreme Court of the United States for a writ of certiorari, it is now here ordered by this Court that the issuance of the mandate herein, be, and the same is hereby, stayed for a period of 60 days from and after this date, and if within said period of 60 days there is filed with the Clerk of this Court a certificate of the Clerk of the Supreme Court of the United States that a petition for writ of certiorari, record and brief have been filed and proof by affidavit of notice thereof under Paragraph 3 of Rule 38 of the Supreme Court be given, the stay hereby granted shall continue until the final disposition of the case by the Supreme Court.

September 21, 1928.

In United States Circuit Court of Appeals

Precipe for Transcript of Record—Filed Sept. 24, 1928

You are hereby requested and authorized to prepare such number of copies as may be necessary for the use of the Supreme Court of the United States on application for review on writ of certiorari, and for service on opposing counsel, of the printed transcript filed with you as Clerk in the Circuit — of Appeals, with such additions thereto as may be necessary on petition for review in the Supreme [fol. 454] Court of the United States on writ of certiorari, and to print such additions, or cause the same to be printed

by the Clerk of the Supreme Court of the United States, as the Rules require.

Earle W. Evans, Attorney for Appellee Standard Oil Company. Thomas F. Doran, Attorney for Appellee Sinclair Refining Company.

[File endorsement omitted]

[fol. 455] Clerk's certificate to foregoing transcript omitted in printing.

[fol. 456] SUPREME COURT OF THE UNITED STATES

ORDER ALLOWING CERTIORARI—Filed January 2, 1929

The petition herein for a writ of certiorari to the United States Circuit Court of Appeals for the Eighth Circuit is granted. And it is further ordered that the duly certified copy of the transcript of the proceedings below which accompanied the petition shall be treated as though filed in response to such writ.

Endorsed on cover: File No. 33,854. U. S. Circuit Court of Appeals, Eighth Circuit. Term No. 545. Standard Oil Company and Sinclair Refining Company, petitioners vs. City of Marysville, L. N. Cole, as Mayor; R. E. Long, et al., etc., et al. Petition for writ of certiorari and exhibit thereto. Filed November 16th, 1928. File No. 33,854.